Final Revision

Mr. Ahmed Elbasha

✸ (1) Write the scientific term :

1) The distance moved through a unit time. (..........................)

2) The combination of the male gamete and female gamete to form a zygote. (..........................)

3) The space which contains all the galaxies, stars, planets and living organisms. (..........................)

4) It is the speed by which the object moves when it covers equal distances at equal periods of time. (..........................)

5) An optical piece is thin at its center and more thick at the tips and diverging light rays falling on it. (..........................)

6) Asexual reproduction takes place in some plants without needing seeds but through their vegetative organs. (..........................)

7) A group of stars that rotate together in cosmic space by the effect of gravity. (..........................)

8) The angle between the reflected light ray and the normal line at the point of incidence on the reflecting surface. (..........................)

9) Fusion of the male gamete and the female gamete to form the zygote. (..........................)

10) The speed of an object relative to an observer. (..........................)

11) The force that controls the orbits of the planets around the Sun according to the modern theory. (..........................)

12) Specialized cells which produce gametes. (..........................)

13) Changing the position of an object as the time passes according to a fixed point. (..........................)

14) A point inside the lens that lies on the principal axis at mid distance between the faces of the lens. (..........................)

15) Something that includes all galaxies , stars, planets and living organisms. (..........................)

16) The rebounding of the light to the same side when it strikes a reflecting surface. (......................................)

17) It is located in one of the spiral arms of the Milky Way galaxy on the edge of the galaxy. (......................................)

18) A medical case as a result of the formation of the image behind the retina. (......................................)

19) The total distance that a moving object covers divided by total time taken to cover this distance. (......................................)

20) The object's speed changes (increases or decreases) by equal values through equal periods of times. (......................................)

21) A biological process, where the living organism produces new individuals of the same kind and thus, ensuring its continuity. (......................................)

22) The angle between the incident light ray and the perpendicular line on the reflecting surface from the point of incidence. (......................................)

23) The nucleic acid that carries the genetic traits of the living organism. (......................................)

24) A mirror, always forms a diminished image for the object. (......................................)

25) The displacement in one second. (......................................)

26) The ability of some animals to compensate their missing parts. (......................................)

27) The point of connection of the two chromatids in a chromosome. (......................................)

28) line that passes through the optical center of the lens without passing through the two centers of curvature of its faces . (......................................)

29) The distance between the pole of a spherical mirror and its center of curvature. (......................................)

30) The speed of a moving body that covers equal distances at unequal time intervals. (......................................)

31) The speed of a moving object relatively to a constant or a moving observer. (......................................)

32) The mirror, whose reflecting surface is a part of the inner surface the sphere. (......................................)

33) A point inside the lens lies on the principal axis in the mid distance between its faces. (......................................)

34) The nucleic acid that carries the genetic traits of the living organisms. (..)

35) Bouncing of the light to the same side when it strikes a reflecting surface. (..)

36) The straight line that passes by center of curvature of the mirror and its pole. (..)

37) A glowing gaseous sphere formed the planets of the solar system. (..)

38) It's a mirror that its reflecting surface is a part of a hallow sphere. (..)

39) The mid-point on the reflecting surface of the mirror. (..)

40) The part in the cell which is responsible for cellular division . (..)

41) The incident light ray, the reflected light ray and the normal line all lie in the same plane perpendicular to the reflecting surface. (..)

42) The combination of a male gamete and a female gamete to from a zygote. (..)

43) A type of asexual reproduction that occurs in simple algae. (..)

44) A phase in which some important vital processes occur to prepare the cell for division and the amount of genetic material duplicates. (..)

45) It is a theory that explains the origin of the universe from a massive explosion since 15000 million years . (..)

46) The mass of cells which result from the abnormal cell when it is continually divided without controlling. (..)

47) It is a very thin plastic lenses and can stick to the eye cornea. (..)

48) A disease that infects the eye lens and it becomes opaque. (..)

49) A vector quantity that equals the displacement in one second. (..)

50) Chemically consists of DNA and protein. (..)

51) Fibers extend between the two poles of the cell in prophase. (.......................................)

52) The image that cannot be received on the screen. (.......................................)

53) A theory assumed that the solar system was originally a big star which is the Sun. (.......................................)

54) A flat gaseous round disk that formed the solar system planets according to the perception of "Laplace" scientist. (.......................................)

55) A cell division that occurs in the somatic cells and results in the growth of the living organism. (.......................................)

56) The actual length of the path that a moving object takes from the starting point of movement to the end point. (.......................................)

57) It is located in one of the spiral arms of the Milky Way on the edge of the galaxy. (.......................................)

58) The line between the two centers of curvature of the lens passing by the optical center of the lens. (.......................................)

59) The phase which the cell prepares to division by the genetic material (DNA) duplicates. (.......................................)

60) The displacement covered through a unit time . (.......................................)

61) The point of connection of two chromatids of the chromosome together. (.......................................)

62) A type of asexual reproduction that takes place in plants' vegetative organs without the need of seeds. (.......................................)

63) A theory based on an astronomical phenomenon in which a star was glowing for a short time , and then its glowing disappears gradually. (.......................................)

64) The value of an object's speed relative to the observer. (.......................................)

65) The total distance covered by a moving body divided by the total time. (.......................................)

66) The physical quantity that has magnitude only and has no direction . (.......................................)

67) A mirror can be used to get virtual, upright and magnified image of an object. (.......................................)

68) **Angle of incidence of the light ray equals its angle of reflection.** (..............................)

69) **A mirror used to form virtual, upright and diminished image.** (..............................)

70) **The line that joins between the two centres of curvature of the lens passing by the optical centre of the lens.** (..............................)

71) **Half the diameter of the sphere, where the face of the lens is a part of it.** (..............................)

72) **It is the point of collection of the refracted light rays or their extensions which are produced, when the light rays fall parallel to the principal axis of a lens.** (..............................)

73) **Seeing the near objects clearly and seeing the far objects distorted.** (..............................)

74) **A flat gaseous round disk that formed the solar system.** (..............................)

75) **The biggest star that can be seen by people clearly on the Earth.** (..............................)

76) **The scientist who established the nebula theory.** (..............................)

77) **A theory assumed that the solar system was originally the Sun.** (..............................)

78) **The unit which is used for measuring the distance between celestial bodies.** (..............................)

79) **It is a wide and extended space that contains all the galaxies, stars and planets.** (..............................)

80) **A theory explains the origin of the universe from a massive explosion since 15000 million years.** (..............................)

81) **The theory that is explained the formation of the galaxies and the stars.** (..............................)

* مواعيد البث المباشر علي يوتيوب ص 11

✱(2) Choose the right answer:

1.The crossing over phenomenon takes place at the end of ....
a. prophase I. b. metaphase I. c. anaphase I. d. telophase I.

2.The ability of some animals to compensate their missing parts is called the ....
a. budding. b. regeneration. c. sporogony. d. sexual reproduction.

3.The line between the centers of curvature of the lens passing by the optical centre of the lens is called the ....
a. focal length. b. principal axis. c. secondary axis. d. radius of curvature.

4.If the speed of a car is 72 km/hour, this means that its speed equals .... *m/s.*
a. 18 b. 20 c. 40

5.The spindle filaments appear during cell division in ....
a. telophase . b. interphase. c . prophase.

6.The image of the object that lies at the center of curvature of a concave mirror is ...
a. real, inverted and enlarged.
b. real , upright and equal to the object.
c. real, inverted and equal to the object.
d. virtual, upright and equal to the object.

7.If the chromosomal number in the male gamete of an organism is 20 so, the chromosomal number in the liver cell equals ....
a. 5 chromosomes. b. 10 chromosomes. c. 20 chromosomes. d. 40 chromosomes.

8.................... established the crossing star theory.
a. Laplace b. Fred Hoyle c. Hubble d. Chamberlain

9.The centromere of each chromosome divides longitudinally and the spindle fibers contract in mitosis during ....
a. prophase. b. metaphase. c. anaphase. d. telophase.

10.The number of chromosomes in the gamete is .... the number of chromosomes in the original cell.
a. equal to b. half c. quarter d. double

11.When the body covers equal distances at unequal periods of time, the speed will be ...
a. regular. b. decelerated. c. accelerated. d. irregular.

12.All the following cells contain full copy of genetic material except ....
a. spore. b. bud. c. zygote. d. pollen grain.

13.The uniform acceleration means that the object speed .... by equal values through equal periods of time.
a. increases only b. decreases only
c. increases or decreases d. doesn't change

14.From the scalar physical quantities is the ....
a. acceleration. b. time. c. velocity. d. displacement.

15.The object moves at a constant (uniform) speed when ....

a. it moves at a constant acceleration.

b. it covers equal distances at unequal times.

c. it covers equal distances at equal times.

d. no correct answer.

16.A concave mirror with a focal length of 20 cm, and the object is placed at a distance of 50 cm from the mirror, the image is formed at a distance ....

a. more than 40 cm. b. more than 20 cm and less than 40 cm.

c. equals 20 cm. d. equals 60 cm.

17.Yeast fungus reproduces asexually by ....

a. regeneration. b. binary fission. c. budding. d. spore.

18.The solar system consists of the Sun and .... planets revolve around it.

a. 7 b.8 c .9 d. 10

19.The image formed by .... is always virtual, erect and small.

a. convex lens b. concave mirror

c. plane mirror d. convex mirror and concave lens

20.The speed of a moving object relative to the observer is considered as .... speed.

a. regular b. average c. vector d. relative

21.If an object at a distance of 3 metres from a plane mirror. The distance between that object and its image is .... metre.

a. 3 b. 6 c.9 d. 12

22.If the number of chromosomes in liver cells of a certain living organism is (32) chromosomes then the number of chromosomes in ovum cell is ....

a. 8 b. 16 c. 24 d. 32

23.The optical piece which forms laterally inverted (reversed) image and equal to the body is ....

a. convex lens b. concave lens c. spherical mirror d. plane mirror.

24.When a moving object covers equal distances in unequal intervals of time, so it moves by ....

a. average speed. b. relative speed. c. uniforms speed. d. irregular speed.

25.The scientist who published a research including his vision about the Nebular assumption ....

a. Chamberlin. b. Laplace. c. Fred Hoyle. d. Molten.

26.An object was put at 10 cm from a concave mirror, a real, inverted and equal image was formed, if the object moved 3 cm towards the mirror, so the formed image will be ....

a. real, inverted and diminished. b. real, inverted and enlarged.

c. virtual diminished. d. virtual enlarged.

27. An observer in a moving car with 80 km/h was observing a moving car with 90 km/h in the same direction so, the observed speed of the 2nd car is ....

a. 10 km/h . b. 80 km/h. c. 90 km/h. d. 170 km/h.

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28. The .... is the phase in which the cell is prepared for division by doubling the genetic material .

a. prophase b. interphase c. metaphase d. anaphase

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29. A concave mirror has a focal length of 8 cm. An object is placed in front of this mirror forming an image at a distance 20 cm from the mirror. This means that the object is placed at .... from the mirror.

a. 8 cm. b. less than 8 cm.

c. 20 cm. d. more than 8 cm. and less than 16 me.

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30. A doctor advised a person who has a sight defect to use glasses with convex lenses. It means that this person suffers from ....

a. a decrease in the convexity of the eye lens surface.

b. an increase in the convexity of eye lens surface.

c. an increase in the eyeball diameter.

d. disability of seeing far objects clearly.

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31. Reproduction by spores occurs in all the following organisms, except ....

a. starfish. b. fungus. c. bread mould. d. mushroom.

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32. One of the vector physical quantities is ....

a. time of a car trip. b. length of a pen.

c. mass of a cat. d. force by which person pushes a stone.

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33. A short sighted person sees the far objects distorted as their images formed ....

a. on the retina. b. behind the retina.

c. in front of the retina. d . in front of the lens .

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34. From examples of the scalar physical quantities is ....

a. the velocity. b. the mass. c. the force . d. the acceleration.

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35. The cell that never divide is ....

a. adult red blood cells. b. the stomach.

c. the liver. d. the skin.

36. Paramecium is a protozoan that reproduces by ....

a. spores. b. budding . c. regeneration. d. binary fission .

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37. reproduction which considered as a source of genetic variation is ……. reproduction.

a. vegetative b. budding c. sexual d. regeneration

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38. The scientist who established the nebular theory is ....

a. Chamberlain . b. Moulton. c. Fred Hoyle. d . Laplace.

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39. (Speed - time) graph for a regular motion at a constant speed is a straight line is ......

a. curved . b. passing by the origin point.

c. parallel to x-axis. d. parallel to y-axis.

40. When an object is placed to face a convex mirror, the image formed is ....

a. lies behind the mirror. b. is real.
c. is erect. d. (a) and (c).

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41. Fred Hoyle relates controlling the Sun in the orbits of the planets around it to .... of the Sun.

a. temperature b. rotation speed c. attraction force d. glowing

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42. The chemical structure of the chromosome is ....

a. the nucleic acid only. b. protein and nucleic acid.
c. protein, fats and nucleic acid. d. all the previous.

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43. The two gases which produced galaxies, stars and universe through millions of years are ....

a. oxygen & helium. b. helium & hydrogen.
c. oxygen & carbon dioxide. d. helium & carbon dioxide.

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44. The universe contains ....

a. galaxies & stars. b. planets and moons .
c. living organisms. d . all the previous.

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45. From the properties of the image formed by a convex mirror is ....

a. virtual. b. real. c. upright. d. (a) and (c) together.

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46. If a person stands at a distance 2 m from a plane mirror, the distance between the person and his image is ....

a. 1 m. b. 2 m. c. 3 m. d. 4 m.

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47. The value of change of an object speed in one second is called ....

a. velocity. b. displacement. c. acceleration. d. speed.

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48. Our solar system is located in one of the .... arms of the Milky way galaxy.

a. spiral b. straight c. circular d. oval

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49. From the scalar quantities ....

a. the time. b. the force. c. the acceleration. d . the displacement.

50. Spindle fibers appear during the cell division in the ....

a. telophase. b. interphase. c. prophase. d. metaphase.

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51. When an object acceleration equal zero this means that ....

a. the body acceleration is decreasing. b. the body speed is variable.
c. the body acceleration is increasing. d. the body speed is uniform.

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52. Within minutes of the Big Bang, the percentage of hydrogen in the universe was ......

a. 25% b. 50% c. 75% d. 100%

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53. The distance and displacement are equal when the body moves in a ....in one direction.

a. zigzag b. circular c. straight line d. curved

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54. The two factors in which the movement of an object can be described ....

a. speed and time. b. distance and time. c. area and time.

55.Property of the image of the object formed by the plane mirror always be ....

a. larger than the object. b. equal to the object. c. smaller than the object.

56.scientists believe that the universe emerged from massive explosion and it is in ....

a. continues contraction. b. contraction then expansion.
c. expansion then contraction. d. continues expansion .

57.If a light ray falls passing through the optical centre of the convex lens, it leaves the lens ....

a. passing through the focus. b. parallel to the principal axis. c . without refraction.

58.The continuous expansion of the universe, is due to ....

a. separation of galaxies. b. approaching of galaxies. c. equivalent to galaxies.

59.The founder of modern theory of the solar system is .... scientist.

a. Moulton b. Chamberlain c. Fred Hoyle

60.The image formed by using a concave lens is ....

a. real , enlarged, and inverted.
b. virtual, smaller and inverted.
c . virtual, smaller and upright.

61.At the end of this phase, the nucleolus and nuclear membrane disappear from the mitosis division ....

a. prophase. b. metaphase. c. telophase.

62.When an object is placed between the focus of a convex lens and its center of curvature, the formed image will be ....

a. real, inverted and diminished. b. real, inverted and magnified.
c. virtual, erect and magnified. d. virtual, erect and diminished.

63.The result of multiplying a speed of moving object by time ....

a. acceleration. b. mass . c. distance. d. force.

64..................... began to form after 3000 million years after the Big Bang.

a. galaxies. b. ancestral galaxies. c. the Sun. d. the Earth.

65.If the length of the radius of curvature of concave mirror 20 cm, then the focal length of the mirror equals ....

a. 5 b. 10 c. 15 d . 20

66.The Milky Way galaxy took its disc form after about .... million years after the Big Bang.

a. 1000 b. 3000 c. 5000 d. 10000

67.From the examples of the vector physical quantities is ....

a. time. b. force . c. mass. d. length.

68. The optical piece which forms an image that inverted and equal to the object is ....

a. concave lens. b. concave mirror.
c. convex mirror. d. plane mirror.

69. The nucleolus disappears during the mitosis cell division in ....

a. prophase. b. metaphase. c. anaphase. d. telophase.

70. (Distance - time) graph for an object moves at regular speed is represented by a straight line ....

a. parallel to time axis. b. parallel to distance axis .
c. passing through the origin point. d. (a) and (c) together.

71. The source of genetic variation is the .... reproduction.

a. budding b. vegetative. c. sexual. d . regeneration.

تقدر تحضر البث المباشر علي يوتيوب لحل الملزمة في المواعيد الاتية بالترتيب:

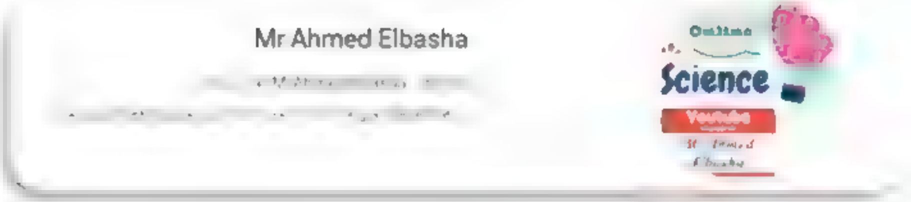
بث مباشر المراجعات النهائية للصف الثالث الإعدادى على قناة مستر احمد الباشا على يوتيوب :

1. البث الأول (الثلاثاء 2023/1/3) الساعة 8:30 م
2. البث الثاني (السبت 2023/1/7) الساعة 8:30 م
3. البث الثالث (الثلاثاء 2023/1/10) الساعة 8:30 م
4. البث الرابع (السبت 2023/1/14) الساعة 8:30 م

بث مباشر اضافي :

1. **الأحد 2023/1/22 الساعة 7 م**
2. **الأثنين 2023/1/23 الساعة 7 م**
3. **الثلاثاء 2023/1/24 الساعة 7 م**

ساعة البث المباشر ادخل على يوتيوب واكتب في البحث (مستر احمد الباشا) وادخل على القناة والبث دائما في اول نتيجة تظهر لك ولا تنسي والأشتراك في القناة



✹(3) Complete the following:

1. The Sun and the surrounding planets revolve around the center of .... galaxy.
2. Mitosis occurs in the .... cells of living organisms.
3. Distance is a .... physical quantity, while force is a .... physical quantity.
4. The scientist who established the modern theory about the evolution of the solar system is ....
5. The distance that a moving object covers within a unit time is known as ....
6. The incident light ray which is parallel to the principal axis of a concave mirror reflects passing through ....
7. The scientists believe that the matter of the universe was a .... ball of high pressure and high temperature.
8. The long-sighted person needs glasses of .... lens.
9. Vegetative reproduction in plants happens by .... division.
10. .... scientist who founded the nebular theory.
11. The spindle fibers are formed during the cell division in ....
12. .... are formed of groups of stars in the universe.
13. Acceleration is considered one of .... physical quantities , while time is considered one of .... physical quantities.
14. The solar system is located in one the .... arms of the Milky Way on the edge of the galaxy.
15. Somatic cells are divided by .... , while reproductive cells are divided by ....
16. In Milky Way galaxy, the old stars (the older) gather in the .... of the galaxy.
17. The incident light ray that passes through the focus of the convex lens, it exits from the lens ....
18. Mass is considered from .... physical quantity.
19. From the scalar physical quantities is ...., while .... is from the vector physical quantities.
20. Condensing the cytoplasm in the two poles of the plant cells forms ....
21. Crossing over phenomenon happens between the .... during the meiosis division.
22. In human and animals, meiosis occurs in .... to produce the male gametes, while it occurs in .... to produce the female gametes.

23. vision defect which is due to the decrease in the eyeball diameter is called .... and is corrected by .... lenses .

24. The two factors which can be used to describe the motion of a body are the.................... and ....

25. The Big Bang theory explain the origin of .... , while the nebular theory is one of the theories which explain the origin of ....

26. In animal cell spindle fibers formed from .... , while in plant cell spindle fibers form .... at the poles.

27. The galaxy that solar system belongs to is called ....

28. The image formed by concave lens is always .... erect and diminished.

29. The nucleolus and nuclear membrane disappear at the end of .... of mitosis.

30. The change of an object position as time passes according to the position of another fixed object is called ....

31. The contact lenses are used instead of the .... and it is made of ....

32. The convex lens .... the light, while the convex mirror . ... the light.

33. The solar system is located in one of the spiral arms of the .... on the ....

34. movement path in one direction may be .... , ... or a combination of both .

35. The cell .... contains the genetic material of the living organism which consists of a number of ....

36. When the object lies in front of .... lens, a virtual and diminished image is formed.

37. The yeast fungus reproduces by .... , while the starfish reproduces by ....

38. The .... scientist established the modern theory of evolution of the solar system.

39. The Egyptian scientist Mustafa El Said discovered a way to detect the cancer cell by using ....

40. A short-sighted person needs a medical eye glasses with .... lenses .

41. The chromosome chemically consists of nuclear acid called DNA and ....

42. The spindle fibers in the animal cell is formed from ...., while in the plant cell the spindle is composed form the .... at the cell poles.

43. From the examples of the multicellular organisms reproduced by budding is ....

44. The point that lies in the middle of the reflecting surface of the concave mirror is called ....

45. The displacement covered by a body in one second is called ....

46. Speed measuring unit is .... , while the measuring unit of acceleration is ....

47. The crossing over phenomenon occurs in .... of .... division .

48. .... and .... are types of spherical mirrors.

49. The Sun and the planets revolving around it, rotate around the center of .... galaxy.

50. .... reproduction doesn't required neither special systems nor structures in the living organisms.

51. .... are used instead of medical glasses to treat vision defects.

52. When the object is placed at .... of the convex lenses, there is no image will be formed.

53. The moving car with 50 Km/h in constant direction its speed appears at 110 Km/h related to observer moves with 60 Km/h in .... direction of the car motion.

54. The crossing over phenomenon occurs in .... of first meiosis division.

55. The solar system consists of a number of .... planets revolve around the Sun.

56. The physical quantity that its magnitude and direction are necessary for identifying it is called ....

57. A concave mirror has a focal length of 20 cm , then the radius of curvature of its spherical surface equals ....

58. Correcting long-sightedness by using .... lens and correcting short-sightedness by using .... lens.

59. Yeast fungus reproduces asexually by ...., while the amoeba reproduces asexually by ....

60. .... image can be received on a screen .

61. The stars move in a fixed orbit around the center of the ....

62. The measuring unit of acceleration is ....

63. Asexual reproduction takes place by .... in the yeast fungus.

64. We use .... lens to obtain a virtual and magnified image.

65. The straight distance covered by the object in a certain direction is called ....

66. The .... telescope is from the space telescopes.

67. The spindle fibers are formed during the cell division in ....

68. The double of the distance between the optical center of a lens and its focus= ....

69. The velocity is the .... in one second.

70. Force is considered .... physical quantity and mass is considered .... physical quantity.

71. two factors which can be used to describe the motion of the body are .... and ....

72. The (speed - time) graph of motion at uniform speed is represented by a .... line

73. The product of the speed of the body x the time = ...

74. If the body moves from rest, so its initial speed equals ....

75. .... is the change of an object's position as time passes according to the position of another object.

76. The graphical relation (speed - time) for regular motion at uniform speed is represented by a straight line . ... to the time axis.

77. The secondary axis of the spherical mirror is any straight line that passes by .... and any point on its surface except....................

78. The short-sighted person needs a medical eye glasses with .... lenses .

79. vision defect which is due to a shortness in the radius of the eyeball is called ....

80. A point inside the lens lies on the principal axis in the mid distance between its faces is called ....

81. point that is in the middle of the reflecting surface of the concave mirror is called ......

82. The phenomenon of the light bouncing off in the same medium when it meets the reflecting surface is called ....

83. The scientist who established the crossing star theory is ....

84. The Sun takes about .... years to complete one rotation around ....

85. The stars move in fixed orbits around the center of the ....

86. The two gases which produced galaxies, stars through millions of years are .... and ....

87. The founder of nebular theory is ....

احرص علي حضور البث المباشر والاشتراك في القناة

✹(4) Correct the underlined words:

1	The solar system includes **nine** planets revolve around the Sun.	……………………
2	The chromosome consists of two chromatids connected at the **cytoplasm**.	……………………
3	Nebular theory suggested that the solar system originated from a glowing gaseous sphere revolving around the **Sun**.	……………………
4	The two gases which produced the galaxies, stars and universe over millions of years are helium and **nitrogen**.	……………………
5	The relative speed of a moving car to an observer at rest is **less than** the real speed .	……………………
6	Reproduction by spore propagation occurs in **paramecium**.	……………………
7	Meiosis happens in the **somatic cells.**	……………………
8	The formed image by the plane mirror is **real and inverted.**	……………………
9	The Sun takes about **100** million years to complete one rotation around the center of the galaxy.	……………………
10	If the speedometer points to 72, this is equivalent to **15** m/s.	……………………
11	In **convex** mirror, the image is inverted and equal to the object.	……………………
12	Many scientists believe that the universe emerged from a massive explosion **500 thousand years** ago .	……………………
13	The chromosomes chemically consists of nuclear acid called (DNA) and **fats**.	……………………
14	If the radius of curvature of a concave mirror equals 20 cm. its focal length will be **30** cm.	……………………
15	In meiotic cell division, Crossing over phenomenon occurs at the end of **Anaphase 1**.	……………………
16	The scientist **laplace** assumed the modern theory about the origin of solar system.	……………………
17	Concave lens **converges** the light rays that falling on its surface.	……………………
18	Sudden violent **chemical** reactions occur within the star which led to its explosion.	……………………

19	Reproduction by sporogony occurs in **starfish**.	....
20	The long-sightedness is corrected by using **concave mirror.**	....
21	Amoeba reproduces by **budding**.	....
22	The formed image of an object that is put at **the centre of curvature** for a convex lens is virtual enlarged.	....
23	The spindle fibers are formed in the plant cell from the **centrosome**.	....
24	Chromosomes are arranged at the middle of the cell in the **telophase**.	....
25	Contact lenses can stick to eye **iris** and can be removed easily.	....
26	**Acceleration** is the actual length of the path that a moving object takes from the starting point of movement to the end point.	....
27	The clear vision for a normal vision person remains, if the object comes closer at a distance not less than **60** cm.	....
28	A phase where some important biological processes occur to prepare the cell for division is called **prophase**.	....
29	Velocity is the quantity that we can identify it accurately by knowing its **magnitude only.**	....
30	If an object is put in front of concave mirror at **focus**, the formed image is real, inverted and equal to the object.	....
31	**Crossing star** is a glowing gaseous sphere revolving around itself, from which the solar system was originated.	....
32	**Average speed** is the speed of a moving object relative to a constant or a moving observer.	....
33	The chromosome consists of two chromatids connected together at the **nucleus**	....
34	The speed of a car can be identified directly by using the **compass**.	....
35	In the universe , groups of **planets** are gathered to form the galaxies.	....
36	When the light ray falls by an angle of **30°** on the reflecting surface, so the reflected ray will be perpendicular on the reflecting surface.	....

37	The parent individual disappears during the reproduction by **sporogony**.	....
38	The universe emerged from the particles of **oxygen and nitrogen.**	....
39	The spindle fibers in the animal cell is formed from **condensing the cytoplasm.**	....
40	The lens is a transparent medium that **reflects** the light.	....
41	In plane mirror the object distance from the mirror is **larger than** the image distance.	....
42	**Asexual** reproduction is a source of genetic variation.	....
43	The Sun takes about **250** million years to complete one rotation around the center of the galaxy.	....
44	If two cars moving in the same direction at the same speed equal 120 m/sec., so the relative speed equal **60 m/sec**.	....
45	**The scientist Isaac Newton** published a research entitled "world order" and that was in 1796.	....
46	**Mitotic cell division (mitosis)** aims to produce gametes.	....
47	Yeast fungus reproduce asexually by **regeneration**.	....
48	The lens is a transparent medium that **reflects** the light and defined with two spherical surfaces.	....
49	Amoeba reproduces by **Budding**.	....
50	The old stars are gather in the **edges** of the galaxy.	....
51	The word ambulance is written on ambulance cars **minimized**.	....
52	Number of chromosomes in an ovum cell containing **double** number of chromosomes in the one of liver cells.	....
53	The **force** is the length of the shortest straight line between two position.	....
54	It is a cell produced due to fertilization called **tetrad** .	....

55	**The lion** is considered one of the fastest wild animals.	....
56	The chromosome chemically consists of nuclear acid called DNA and **starch**.	....
57	**The irregular speed** is the value of displacement at a unit time and is a vector quantity.	....
58	**The crossing star** is the largest star that can be seen from the surface of the Earth.	....
59	In the Big Bang theory explains that the universe is formed by the cohesion of **Oxygen** and Nitrogen particles.	....
60	Chromosomes pairs arranged on the cell's equator in **anaphase 1.**	....
61	the solar system is located in one of the **circular** arms of the Milky Way galaxy.	....
62	When putting a body on a distance of 16 cm from a concave mirror its focal length is 12 cm, then the image formed will be **virtual upright** and magnified image.	....
63	Displacement is described by magnitude and **time.**	....
64	a boat starts to move from rest till its speed becomes 2.5 m./sec. through 5 sec. this means that it moves with acceleration **10** m/sec^2	....
65	The total distance covered by a moving body divided by the total time taken equals the **non-uniform speed.**	....
66	The **incident light** ray is the light ray that bounces from the reflecting surface.	....
67	A concave mirror of focal length 10 cm , so its radius of curvature equals **5 cm.**	....
68	**The focus** is a point inside the lens placed on the principal axis in the mid distance between its faces.	....
69	When an object is placed at the centre of curvature of the mirror, the formed image is real , inverted and **enlarged**.	....
70	The **real** image cannot be received on a screen.	....
71	A spherical mirror whose diameter is 40 cm, so its focal length equals **40 cm.**	....
72	Eight planets including the Earth rotate around the **galaxy**.	....

✸(5) Give reason for:

1. Displacement is a vector quantity.

....

2. focal length of a concave mirror can be determined by knowing its radius of curvature.

....

3. The continuous expansion of space.

....

4. The image formed by the convex mirror can't be received on a screen.

....

5. The formed image by the convex mirror is always virtual.

....

6. Occurrence of interphase before starting the cell division .

....

7. When the object is placed at the focus of a convex lens, the image is not formed.

....

8. There are no new races of grapes , when they reproduce by vegetative reproduction.

....

9. The nebula lost its sphere form and became in a form of a flat rotating disk.

....

10. The body which moves at acceleration can't move at a regular speed.

....

11. Shrinking of spindle fibers during the anaphase.

....

12. (Distance - Time) graph of an object that moves at uniform speed is a straight line passing through the origin point.

....

13. Asexual reproduction in living organisms produces individuals identical in genetic structure.

....

14. Word ambulance is written in a converted (laterally inverted) way on the ambulance car.

....

15. The short-sightedness is corrected by using a concave lens.

....

16. Cellular division begins with interphase before starting mitosis division.

....

17. The lens had two centers of curvature (C1 and C2).

....

18. Binary fission is considered a mitotic division.

....

19. The force is a vector quantity.

....

20. Uniform speed for a car hard to done practically.

....

21. Crossing over phenomenon is an important factor in genetic variation among individuals of the same species.

....

22. Meiotic division is called by reduction division.

....

23. Pilots take in consideration the velocity of the wind.

....

24. The image formed by a plane mirror cannot be received on the screen.

....

25. When you look at the mirror you see your face image.

....

26. Mitosis is important for children, unlike the meiosis.

....

27. The perpendicular incident light ray on plane mirror reflects on itself.

....

28. Cataract disease infects the eye.

....

29. Sexual reproduction is a source of genetic variation .

....

30. There are no new races (new individual with other trait) of plants, when they reproduce by vegetative reproduction.

....

31. Occurrence of interphase before starting the mitosis cell division.

....

32. The constancy of the planets in their orbits around the Sun.

....

33. The concave lens is used to treat a short-sightedness person.

....

34. The word "AMBULANCE" is written laterally inverted way on the ambulance car.

....

35. The Sun escaped from the gravity of the huge star in the crossing star theory.

....

36. The number of chromosomes is constant in the same species which reproduce sexually.

....

37. In short-sightedness , the retina is far from the eye lens.

....

38. The object which moves at regular speed , its acceleration equals zero.

....

39. Distance is a scalar physical quantity.

....

40. Speed of a moving body increases by decreasing time needed to cover a certain distance.

....

✹(6) What happen if:

1. Absence of centrosome in the animal cell.

....

2. A light ray is incident passing through the optical center of a convex lens.

....

3. Less convexity of the eye lens surfaces.

....

4. Approaching of a huge star to the Sun according to the crossing star theory.

....

5. When an injured liver or cutting a part of it.

....

6. To the displacement of a moving body when it returns back to its starting point.

....

7. To the speed of a body if it covers the same distance in half the time.

....

8. When rupturing sporangium in bread mound fungus.

....

9. To the distance between the image and the plane mirror when the body becomes closer to the mirror.

....

10. Reproductive cells are divided by meiosis.

....

11. The initial speed of a moving body is greater than the final speed.

....

12. The combination of the male gamete and female gamete.

....

13. If the starfish loses one of its arms containing a part of its central disc .

....

14. If the incident light ray falls parallel to the principal axis of concave mirror.

....

15. Focusing laser on the gold Nano-particles in the cells infected by cancer.

....

16. A light ray is incident passing through the center of curvature of a concave mirror.

....

17. A light ray passes through the optical center of the lens.

....

18. Putting a yeast fungus in a warm sugary solution.

....

19. The nebula gradually lost its heat (from point of view of Laplace scientist).

....

20. The liver gets injured or apart of it is cut.

....

21. The parts of the inner chromatids are exchanged in the first prophase.

....

22. An object is put at the focus of a convex lens.

....

23. The starfish misses one of its arms and it contains a part of its central disk.

....

24. The centrosome disappears from the animal cell .

....

25. Reflection of a light ray falls on a concave mirror to pass with its focus.

....

26. A body is placed at a distance less than the focal length of a concave mirror.

....

27. The shortness of the diameter of the eyeball.

....

✹(7) Define each of the following :

1. The scalar physical quantity.

....

....

2. The crossing over phenomenon.

....

....

3. The optical center of the lens.

....

....

4. The binary fission.

....

....

5. Contact lens.

....

....

6. Tetrad.

....

....

7. The focal length of a lens.

....

....

8. Zygote.

....

....

9. Fertilization.

....

....

10. Irregular speed.

....

....

11. The radius of curvature of a mirror.

……………………………………………………………………………………

……………………………………………………………………………………

12. Reproduction by sporogony (spore propagation).

……………………………………………………………………………………

……………………………………………………………………………………

13. Average speed.

……………………………………………………………………………………

……………………………………………………………………………………

14. Angle of incidence.

……………………………………………………………………………………

……………………………………………………………………………………

15. Regular (uniform) speed.

……………………………………………………………………………………

……………………………………………………………………………………

16. The pole of the mirror.

……………………………………………………………………………………

……………………………………………………………………………………

✱(8) Problems

1

An object moves in a straight line northward at a speed of 5 m/sec. and its speed reaches 20 m/sec through 3 seconds.

Calculate the following:

1. The velocity after 3 seconds.

2. The acceleration of the moving object.

....

....

....

2

Two race cars, the first car moves at a speed of 80 km/h, while the second car moves at a speed of 120 km/h, in the same direction. Mention the following :

1. The relative speed of the first car relative to an observer standing on one side of road.

2. The relative speed of the second car relative to passenger in the first car.

....

....

3

A car moved from rest and its speed became 25 m/s. during 10 seconds.

Calculate its acceleration.

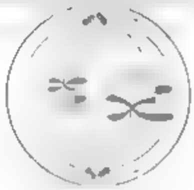
....

....

....

4

The opposite figure represents one of meiotic division (meiosis) phases :



1 . What is the name of this phase ?

2. Draw the phase next to this phase.

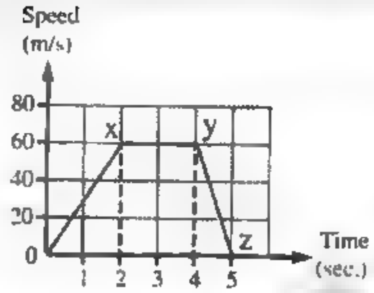
....

....

....

5

From the opposite graph which represents the motion of a ca



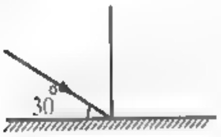
1. value of the maximum speed of the car equals .... m/s.

2. The kind of acceleration in part (yz) is ....

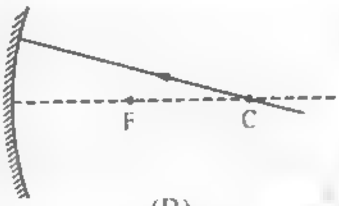
6

In the following two figures :

What is the value of the angle of reflection of the incident rays in figures (A) and (B)?



(A)



(B)

....

....

....

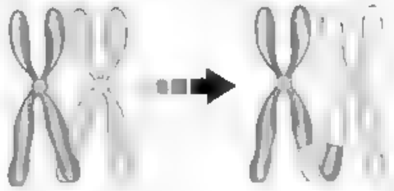
7

The opposite figure shows a vital phenomenon :

1. What is the name of this phenomenon?

2. Mention the name of the phase in which this phenomenon occurs and mention the type of its division.

3. What is the importance of its occurrence ?



....

....

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8

Write the assumptions of crossing star theory for the origin of the solar system **(4 assumptions only).**

....

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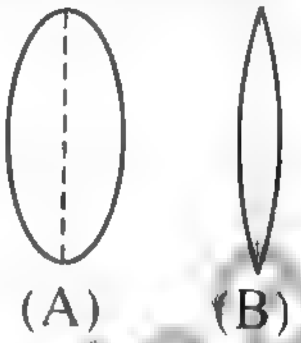
....

....

9

In the opposite figure, two eye lenses for two eyes equal in eye diameter for two different persons.

Which of them has short-sightedness and why ?



....

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10

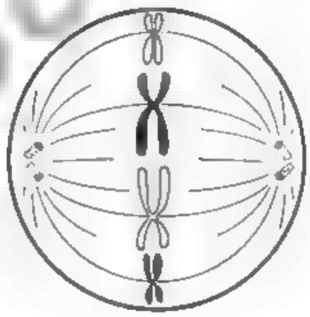
Through your study the stages of mitotic division answer the following :

1. Name the phase that preceding this phase the figure.

2. In which phase the centromere of each chromosome is split lengthwise into two halves ?

3. In which phase the spindle fibers disappear ?

4. What the importance of interphase?



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11

Explain by drawing :

The formed image by convex lens, when the body at a distance greater than double the focal length. Then write the properties of the formed image.

....

....

....

....

12

Calculate the actual speed of the car whose relative speed is (80 km/h) relative to an observer moving in opposite direction at a speed of (30 km/h).

....

....

....

13

An object is placed at a distance of (8 cm) from a concave lens has a focal length (2 cm) :

1. Draw the direction of the ray that eye sees the image.

2. Mention the properties of image formed.

....

....

....

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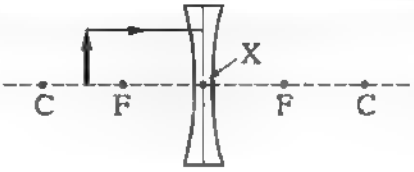
14

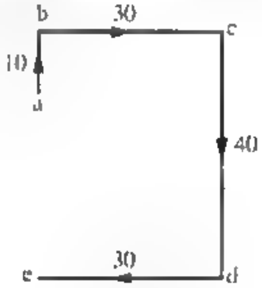
1. Copy the figure then draw the rays that form the image of the object.
2. The point (X) refers to ......



15

A person moves in the path (a b c d e) as shown in figure, he covered a distance of 10 m. northward in 2 seconds, then he covers 30 m. eastward in 10 seconds. and followed by 40 m. southward in 8 seconds, finally 30 m. westward in 5 sec.

1. Calculate the displacement of the person from the start of motion to end.
2. In which part of the person motion, his speed was the least ?



....

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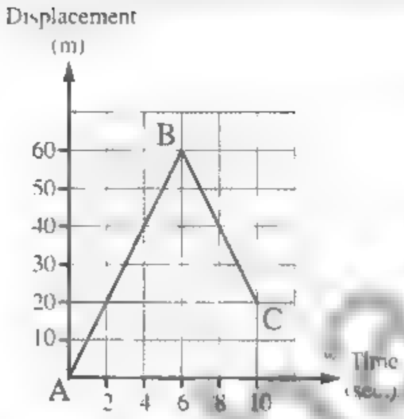
....

16

In the opposite figure , that represents the movement of an object from point (A) to point (C) passing by point (B), **Calculate the following :**

1. Speed.

2. Velocity.



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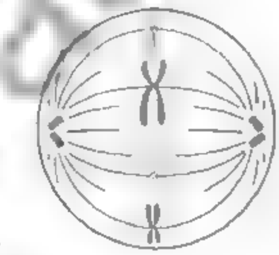
17

The figure in front of you shows a phase of cell division. Answer the following :

1. What is the type of this division ?
2. What is the name of this phase ?
3. What is the importance of this type of division ?



....

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18

A car moved from Banha to Cairo at a distance of 40 km in 30 minutes , then it returns back from Cairo to Banha in the same time. Calculate (in km/h) :

1. The car velocity from the beginning to the end of the journey.

2. The average speed of the car during the total time.

....

....

....

19

Mention the properties of the formed image in each of the following cases :

1. An object is placed in front of a convex mirror.

2. An object is placed in front of a convex lens at a distance less than its focal length .

3. An object placed at the focus of a convex lens.

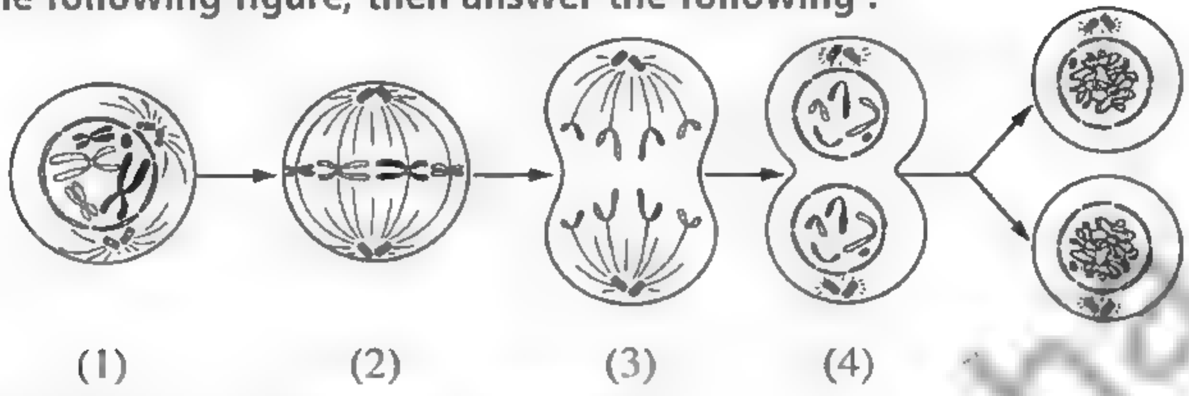
....

....

....

20

Look at the following figure, then answer the following :



1. What is the kind of cell division in this figure ?
2. What is the name of phases number (2) and (3).
3. What will disappear in phase number (1).

....

....

....

21

When each of the following values equal "Zero" :

1. Reflecting angle of a light ray incident on a plane mirror.
2. The velocity of a moving object.
3. Reflecting angle for an incident ray falls on reflecting surface of a cancave mirror.

....

....

....

22

An object is placed at a distance of 30 cm from a concave mirror with a radius of curvature 40 cm.

1. Calculate the focal length of the mirror.
2. Show by drawing the path of rays that show the formed image in this case.

....

....

....

....

23

Two cells are divided, one of them in the plant stem and the other in the plant ovary, if you know the number of chromosomes in each of them is 6 pairs of chromosomes, mention:

1. The kind of cell division in each cell.
2. The number of chromosomes in each resulted cell.

....

....

24

In the opposite figure :

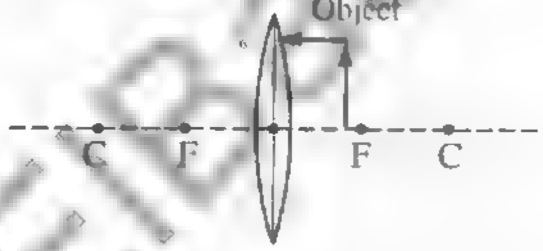
1. Complete the path of the rays to form an image for the object.
2. Mention the properties of the formed image.

....

....

....

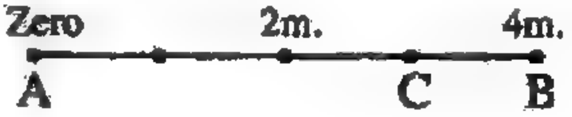
....



25

A person moves from point (A) to point (B), then changes his direction to point (C) through 10 seconds, Calculate :

1. The total distance covered by the person.
2. The displacement done by the person.
3. The velocity.



....

....

26

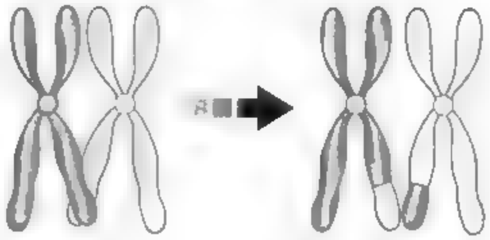
The opposite figure represents the crossing over phenomenon, Answer the following :

1. What happens in this phenomenon ?
2. What is the name of the phase in which this phenomenon occurs?
3. Draw the following phase to the phase in which this phenomenon occurs.

....

....

....

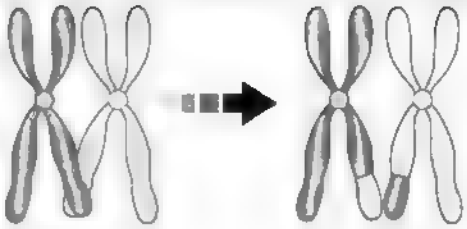


....

27

The opposite figure :

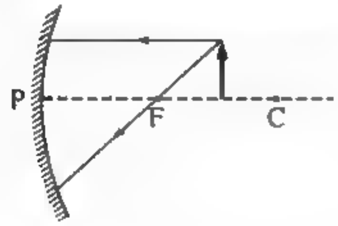
1. What is the name of this phenomenon in front of you ?
2. What is the importance of its occurrence.
3. Mention name of phase that this phenomenon occurs ?



28

Draw the figure in your answer paper, then :

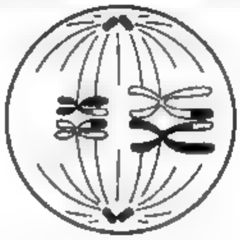
1. Complete the path of the incident rays on the mirror from the object.
2. Mention the characteristics of the formed image and its position.



29

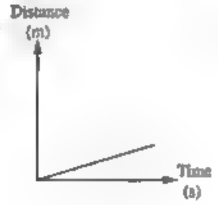
The opposite figure represents one of the division phases:

1. What is the name of this phase and the type of division ?
2. What is the name of next phase that follow it.

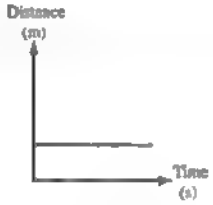


30

Describe the motion of the object in each of the following graph :



(1)



(2)

31

A racer covered 50 meters northward within 30 seconds then 100 meters eastward within 60 seconds then 50 meters southward within 10 seconds, and then returns back to the start point within 40 seconds :

1. Calculate the total distance that the racer moved ?
2. What is the average speed of the racer?
3. Calculate the displacement ?

....

....

....

32

The opposite graph represents the (distance - time) graph for the movement of two objects A , B From the graph, answer the following :

1. What is the kind of speed of the two objects ?

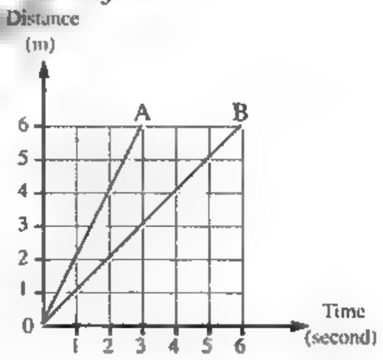
2. Calculate the ratio between the speed of object A and the speed of object B

....

....

....

....



....

33

The opposite figure represents one of the important process to complete the reproduction. Answer the following :

1. What is the name of the process that number (3) refers to and what is the name of the produced cell ?

2. What is the importance of forming the cell number (3) ?

3. What is the kind of division in part (4)?

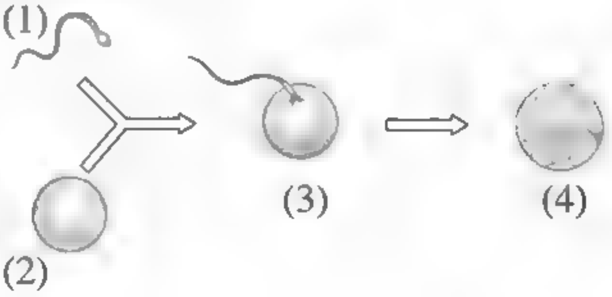
4. What is the number of chromosomes in the cell number (1)?

....

....

....

....



....

34

An object is placed at a distance of 5 cm from a convex lens its focal length is 3 cm. Show by drawing the position of the formed image and mention the properties of this image, **by drawing two light rays only.**

....

....

....

35

"A car starts movement from rest until its speed reaches 25 m/s after 10 seconds."

1. Calculate the value of acceleration.

2. What kind is the acceleration ?

....

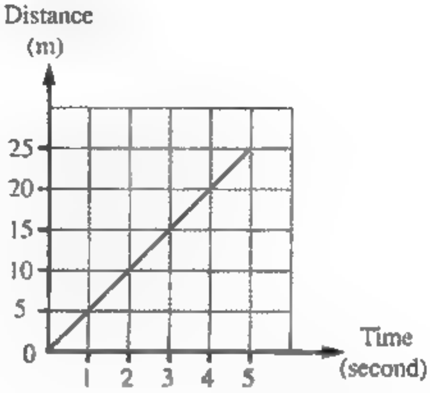
....

....

36

An object moves according to the graphical relation shown in the opposite figure, **calculate** :

1. The speed of the object's motion and mention its kind.
2. The time that the object takes to cover a distance of 15 meters.
3. The distance that the object covers in 4 seconds.



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Model answer

✹ (1) Write the scientific term :

1. Speed
2. Fertilization
3. Universe
4. Uniform speed
5. Concave lens
6. Vegetative reproduction
7. Galaxy
8. Angle of reflection
9. Fertilization
10. Relative speed
11. Gravity (attraction force)
12. Reproductive cell
13. Motion
14. Optical center
15. Universe
16. Light reflection
17. Solar system
18. Long-sightedness
19. Average speed
20. Uniform acceleration
21. Reproduction process
22. Angle of incidence
23. DNA
24. Convex mirror
25. Velocity
26. Regeneration
27. Centromere
28. Secondary axis
29. Radius
30. Non-uniform speed
31. Relative speed
32. Concave mirror
33. Optical center
34. DNA
35. Light reflection
36. Principal axis of mirror
37. Nebula
38. Spherical mirror
39. Pole of mirror
40. Nucleus
41. Second law
42. Fertilization
43. Binary fission
44. Interphase
45. Big bang
46. Tumor
47. Contact lens
48. Cataract
49. Velocity
50. Chromosome
51. Spindle fiber
52. Virtual image
53. Crossing star theory
54. Nebula
55. Mitotic
56. Distance
57. Solar System
58. Principal axis
59. Interphase
60. Velocity
61. Centromere
62. Vegetative reproduction
63. Star explosion phenomenon
64. Relative speed
65. Average speed
66. Scalar quantity
67. Concave mirror
68. First law
69. Convex mirror
70. Principal axis of lens
71. Radius
72. Focus
73. Short-sightedness
74. Nebula
75. Sun
76. Laplace
77. Crossing star theory
78. Light year
79. Universe
80. Big bang
81. Big bang

✹(2) Choose the right answer:

1. A
2. B
3. B
4. B
5. C
6. C
7. D
8. D
9. C
10. B
11. D
12. D
13. C
14. B
15. C
16. B
17. C
18. B
19. D
20. D
21. B
22. B
23. D
24. D
25. B
26. B
27. A
28. B
29. D
30. A
31. A
32. D
33. C
34. B
35. A
36. D
37. C
38. D
39. C
40. A
41. C
42. B
43. B
44. D
45. D
46. D
47. C
48. A
49. A
50. C
51. D
52. C
53. C
54. B
55. B
56. [illegible]
57. C
58. A
59. C
60. C
61. A
62. B
63. C
64. A
65. B
66. C
67. B
68. B
69. A
70. C
71. C

✹(3) Complete the following :

1. Milky way
2. Somatic
3. Scalar vector
4. Fred Hoyle
5. Speed
6. Focus
7. Gaseous
8. Convex
9. Mitosis
10. Laplace
11. Prophase
12. Galaxy
13. Vector scalar
14. Spiral
15. Mitotic – meiotic
16. Center
17. Parallel to principal axis
18. Scalar
19. Mass – force
20. Spindle fiber
21. Inner chromatid
22. Testis - ovary
23. Long-sightedness convex
24. Distance – time
25. Universe solar system
26. Centrosome - cytoplasm
27. Milky way
28. Virtual
29. Prophase
30. Motion
31. Medical glasses – plastic
32. Converge diverge
33. Milky way – edge of galaxy
34. Straight , curved
35. Nucleus chromosome
36. Concave
37. Budding regeneration
38. Fred Hoyle
39. gold
40. Concave
41. Protein
42. Centrosome – condensing of cytoplasm
43. Hydr
44. Pole of mirror
45. Velocity
46. m/s - m/s^2
47. Prophase I – first meiotic
48. Concave convex
49. Milky way
50. Asexual
51. Contact lens
52. Focus
53. Opposite
54. Prophase I
55. Eight
56. Vector
57. 40
58. Convex concave
59. Budding binary fission
60. Real
61. Galaxy
62. m/s^2
63. budding
64. Convex
65. Displacement
66. Hubble
67. Prophase
68. Radius
69. Displacement
70. Vector – scalar
71. Distance – time
72. Straight
73. Distance
74. Zero
75. Motion
76. Parallel
77. Center of curvature – pole of mirror
78. Concave
79. Long-sightedness
80. Optical center
81. Pole of mirror
82. Light reflection
83. Chamberlain and moulton
84. 220 Million milky way
85. Galaxy
86. Hydrogen and helium
87. Laplace

✹(4) Correct the underlined words:

1. Eight
2. Centromere
3. Itself
4. Hydrogen
5. Equal
6. Mushroom
7. Reproductive cell
8. Virtual and erect
9. 220
10. 20
11. Concave
12. 15000 million
13. Protein
14. 10
15. Prophase I
16. Fred Hoyle
17. Diverge
18. Nuclear
19. Binary fission
20. Convex lens
21. Binary fission
22. Less than focus
23. Condensing of cytoplasm
24. Metaphase
25. Cornea
26. Distance
27. 25
28. Interphase
29. Magnitude and direction
30. Center of curvature
31. Nebula
32. Relative speed
33. Centromere
34. Speedometer
35. Stars
36. Zero
37. Binary fission
38. Hydrogen and helium
39. Centrosome
40. Refract
41. Equal
42. Sexual
43. 220
44. zero
45. Laplace
46. Meiotic cell division
47. Budding
48. Refract
49. Binary fission
50. Center
51. Laterally inverted
52. Half
53. Displacement
54. Zygote
55. Cheetah
56. Protein
57. Velocity
58. Sun
59. Hydrogen
60. Metaphase I
61. Spiral
62. Real – inverted
63. Direction
64. 0.5
65. Average
66. Reflected ray
67. 20
68. Optical center
69. Equal to object
70. Virtual
71. 10
72. Sun

✸(5) Give reason for:

1. Because they have magnitude and direction
2. Because focal length (f) =1/2 x radius of curvature (r)
3. Due to the movement of galaxies apart
4. Because it is a virtual image.
5. Because it is formed behind the mirror from the intersection of the extensions of the reflected light rays and it can't be received on a screen.
6. To prepare the cell for division through some important biological processes where the amount of genetic material duplicates.
7. Because the penetrating rays from a lens don't meet and pass through a parallel way at infinity
8. Because vegetative reproduction depends on mitotic division, in which the produced cells contain a full copy of the genetic material of the parent cells.
9. because its revolving speed around itself increased.
10. Because its speed changes by passing time.
11. To form two identical groups of chromosomes at each pole of the cell.
12. Because the distance is directly proportional to the time when the object moves at a constant speed.
13. Because it occurs through one parental individual and through a mitotic division as the new individual gets a genetic copy identical to the parent.
14. Because the mirrors of the cars in front of the ambulance car, form a laterally inverted image for this word, and thus it appears laterally corrected to the drivers.
15. Because the concave lens diverges the rays coming from a far object, so the image is formed on the retina
16. To prepare the cell for division through some important biological processes where the amount of genetic material duplicates.
17. Because they have two circular surfaces, each surface has a center.
18. Because two identical cells are produced, each one is identical to the original cell.
19. Because they have magnitude and direction
20. Because its speed changes by passing time.
21. Because it contributes in genes exchanging between the two homologous chromosome's chromatids and distributing them randomly in the gametes.
22. Because the produced cells contain half the number of chromosomes of the original cell
23. Because the direction of the wind affects the velocity of the plane and hence the time of the trip and the amount of the fuel consumed.
24. Because it is a virtual image.
25. Due .to light reflection
26. Because mitosis division plays an important role in growth which the body of children needs, while meiosis division aims to the production of gametes in adults only.
27. Because the angle of incidence equals the angle of reflection equals zero.
28. Due to the following reasons . - Old age - Illness. - Side effects of drugs - Genetic readiness
29. Due to the occurrence of the crossing over phenomenon during it.
30. Because vegetative reproduction depends on mitotic division, in which the produced cells contain a full copy of the genetic material of the parent cells.
31. To prepare the cell for division through some important biological processes where the amount of genetic material duplicates.
32. Due to the Sun gravity.
33. Because concave lens diverges the rays coming from a far object, so the image is formed on the retina
34. Because the mirrors of the cars in front of the ambulance car, form a laterally inverted image for this word, and thus it appears laterally corrected to the drivers.
35. Due to the explosion in the expanded part of the Sun that faces the huge star
36. Due to meiosis division (which reduce the number of chromosomes) in gametes, then the combination of male gamete (N) and female gamete (N) to form a zygote which contains the whole number (diploid number) of chromosomes (2N)
37. Due to the increase in the eyeball diameter
38. Because its speed doesn't change by passing time (ΔV =Zero).
39. Because they have magnitude only and have no direction
40. Because speed = d/t so, speed is inversely proportional to the time.

✹(6) What happen if:

1. The spindle fibers are not formed therefore the cell division doesn't completed.
2. It passes through the lens without refraction.
3. This causes long-sightedness
4. The star attracted the Sun to it which led to a great expansion in the part of the Sun facing it.
5. The remaining cells undergo many mitotic divisions to compensate the missing part
6. The displacement equal zero
7. It will increase to double
8. A large number of spores are released.
9. The image will move close to the mirror
10. They will produce the gametes that contain the half number of chromosomes.
11. The body speed decreases by passing time and the movement is described as a decelerating motion.
12. A zygote is produced which when it grows, it gives a new offspring with traits of its parents
13. This part grows forming a new individual
14. It reflects passing through the focus
15. the nano-molecules of gold which stuck the surface of cancerous cell absorb the light of laser and convert it into heat which leads to burn and kill the infected cell
16. It reflects on itself
17. It passes through the lens without refraction.
18. The yeast fungus reproduces asexually by budding forming a new fungus separated from the parent cell or it remains connected to the parent cell forming a colony.
19. Its size contracted and its revolving speed around itself increased
20. The remaining cells undergo many mitotic divisions to compensate the missing part
21. Crossing over phenomenon occurs.
22. No image is formed.
23. The starfish compensates its lost arm and the arm forms new individual if it contains a part of the central disc.
24. The spindle fibers are not formed therefore the cell division doesn't completed.
25. It will reflection parallel to principle axis
26. A virtual , erect and magnified image is formed behind the mirror
27. This causes the shortness of the radius of the eye sphere, thus the retina is close to the eye lens and this causes long-sightedness

تقدر تحضر البث المباشر علي يوتيوب لحل الملزمة في المواعيد الاتية بالترتيب:

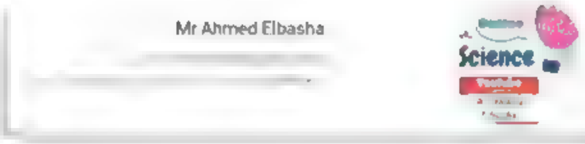
بث مباشر المراجعات النهائية للصف الثالث الإعدادى على قناة مستر احمد الباشا على يوتيوب :

1. البث الأول (الثلاثاء 2023/1/3) الساعة 8:30 م
2. البث الثاني (السبت 2023/1/7) الساعة 8:30 م
3. البث الثالث (الثلاثاء 2023/1/10) الساعة: 8:30 م
4. البث الرابع (السبت 2023/1/14) الساعة 8:30 م

بث مباشر اضافي :

1. الأحد 2023/1/22 الساعة 7 م
2. الأثنين 2023/1/23 الساعة 7 م
3. الثلاثاء 2023/1/24 الساعة 7 م

ساعة البث المباشر ادخل على يوتيوب واكتب في البحث (مستر احمد الباشا) وادخل على القناة والبث دائما في اول نتيجة تظهر لك ولا تنسي والاشتراك في القناة



(7) Define each of the following :

1. It is the physical quantity that has magnitude only and has no direction.
2. It is a phenomenon that takes place at the end of prophase I and, in which some parts of the two inner chromatids of each tetrad are exchanged to produce new genetic arrangements
3. It is a point inside the lens that lies on the principal axis in the mid distance between its faces.
4. It is a type of asexual reproduction where the nucleus divides mitotically, then the cell splits into two identical cells
5. They are very thin lenses made of plastic and can stick to the eye cornea by the eye fluid
6. They are the arrangement of homologous pairs of chromosomes where each pair consists of 4 chromatids.
7. It is the distance between the principal focus and optical center of the lens.
8. It is a cell produced due to fertilization and it contains the complete number of chromosomes of the living organism
9. It is the combination of a male gamete (N) and a female gamete (N) to form a zygote (2N).
10. It is the speed by which the object moves when it covers equal distances at unequal periods of time.
11. It is the radius of the sphere that the mirror is a part of it.
12. It is a type of asexual reproduction that occurs in some fungi and algae by producing spores.
13. It is the regular speed by which the object moves to cover the same distance at the same period of time.
14. It is the angle between the incident light ray and the normal.
15. It is the speed by which the object moves when it covers equal distances at equal periods of time (whether the distance and time are short).
16. It is the point that lies in the middle of the reflecting surface of the mirror.

تقدر تحضر البث المباشر علي يوتيوب لحل الملزمة في المواعيد الاتية بالترتيب:

بث مباشر المراجعات النهائية للصف الثالث الإعدادى على قناة مستر احمد الباشا على يوتيوب :

1. البث الأول (الثلاثاء 2023/1/3) الساعة 8:30 م
2. البث الثاني (السبت 2023/1/7) الساعة 8:30 م
3. البث الثالث (الثلاثاء 2023/1/10) الساعة: 8:30 م
4. البث الرابع (السبت 2023/1/14) الساعة 8:30 م

بث مباشر اضافي :

1. الأحد 2023/1/22 الساعة 7 م
2. الأتنين 2023/1/23 الساعة 7 م
3. الثلاثاء 2023/1/24 الساعة 7 م

ساعة البث المباشر ادخل على يوتيوب واكتب في البحث (مستر احمد الباشا) وادخل على القناة والبث دائما في اول نتيجة تظهر لك ولا تنسي والاشتراك في القناة

Science
Mr.Ahmed Elbasha

✸(8) Problems

1

1. The velocity after 3 sec is 20 m/s northward direction.
2. Acceleration (a)

$$= \frac{\text{Final speed } (V_2) - \text{Initial speed } (V_2)}{\text{Time at which change occurs } (\Delta t)}$$

$$a = \frac{20-5}{3} = \frac{15}{3} = 5 \text{ m/s}^2$$

2

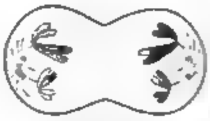
1. The relative speed of the first car relative to an observer standing on one side of the race road = 80 km/h.
2. The relative speed of the second car relative to passenger in the first car = 120 – 80 = 40 km/h.

3

$$\text{Acceleration (a)} = \frac{\Delta V}{\Delta t} = \frac{V_2 - V_1}{\Delta t} = \frac{25-0}{10} = 2.5 \text{ m/s}^2$$

4

1. Metaphase I
2. Anaphase I



Ananphase I

5

1. 60
2. negative acceleration (Decelerating motion).

6

(A) The angle of reflection = 60°

(B) The angle of reflection = zero

7

1. Crossing over phenomenon.
2. – This phenomenon occurs at the end of prophase I.
   – The type of the division is meiotic division.
3. Its importance :
   It works on the variation of genetic traits among the members of the same species, where it contributes in genes exchanging between the two homologous chromosome's chromatids and distributing them randomly in the gametes.

8

- **Assumptions of the crossing star theory :**
  It assumed that the origin of the solar system was the Sun.

1. Another huge star (crossing star) approached to the Sun.
2. This star attracted the Sun to it which led to a great expansion in the part of the Sun facing this star.
3. **The expanded part from the Sun was exploded which led to :**
   - The Sun escaped from the gravity of that star.
   - A gaseous line was formed of a great length from the Sun to the last planets.
4. The gaseous line started to condense due to the attraction force, then it cooled forming the planets.

9

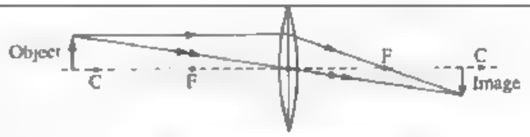
– The person who has the eye lens (A) suffers from short-sightedness.

– As the convexity of this lens face is large, so the focus nearer to the optical centre which lead to form a shorter focal length for the eye lens, so an unclear image is formed in front of the retina.

10

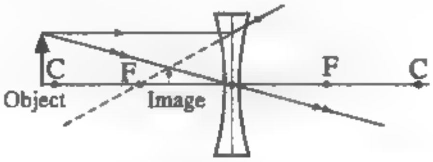
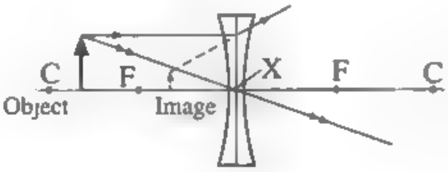
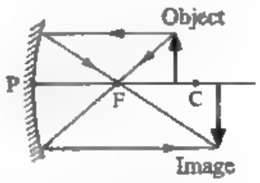
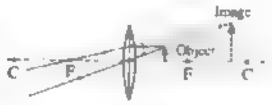
1. prophase. 2. Anaphase.
3. Telophase.
4. The cell prepare itself for division.

11



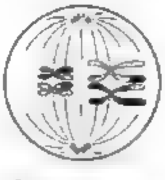
The properties of the formed image :

– real, inverted and diminished.

12	Actual speed = relative speed – observer's speed. = 80 – 30 = 50 km/h
13	1.  2. The properties of the formed image : virtual, erect and diminished.
14	1.  2. The optical centre
15	1. The displacement = 40 – 10 = 30 m. To the south. 2. $V_{(ab)} = \frac{10}{2} = 5$ m/sec. $V_{(bc)} = \frac{30}{10} = 3$ m/sec. $V_{(cd)} = \frac{40}{8} = 5$ m/sec. $V_{(de)} = \frac{30}{5} = 6$ m/sec. ∴ The person moves with the least possible speed in the part (bc).
16	1. Distance = AB + BC = 60 + (60 – 20) = 100 m speed = $\frac{d}{t} = \frac{100}{10} = 10$ m/sec. 2. Velocity = $\frac{\text{displacement}}{\text{time}} = \frac{20}{10} = 2$ m/sec.
17	1. Mitosis. 2. Metaphase. 3. – The growth of living organism. – The compensation of the damaged cells.
18	1. Velocity = $\frac{\text{displacement}}{\text{time}} = \frac{\text{zero}}{1}$ = zero 2. Average speed = $\frac{\text{total distance}}{\text{total time}}$ $= \frac{80}{1} = 80$ km/h.
19	1. Virtual, erect and diminished image always formed. 2. Virtual, erect and magnified image is formed at the same side of the object. 3. No image is formed.
20	1. Mitotic division. 2. Metaphase – anaphase. 3. Nucleolus and nuclear membrane
21	1. When the incident light ray falls prependicular on the reflecting surface, Incident angle = Reflecting angle = zero. 2. When the moving object returns back to the same starting point, The displacement = zero, and so velocity = zero. 3. When the incident light ray falls passing through the centre of curvature of a concave mirror, Incident angle = Reflecting angle = zero
22	1. Focal length = $\frac{r}{2} = \frac{40}{2} = 20$ cm 2. 
23	1. In the plant stem cell: mitosis In the ovary cell : meiosis. 2. The resulted cell from mitosis : 6 pairs The resulted cell from meiosis : 3 pairs.
24	1.  2 The properties of the formed image Virtual, upright and magnified.
25	1. The total distance = $\overline{AB} + \overline{BC} = 4 + 1 = 5$ m 2. Displacement = $\overline{AB} - \overline{BC} = 4 - 1 = 3$ m in the direction of east 3. The velocity = $\frac{\text{displacement}}{\text{time}} = \frac{3}{10}$ = 0.3 m/sec. in the direction of east

26

1. Some parts of the two inner chromatids of each tetrad are exchanged to produce new genetic arrangment.
2. Prophase 1 (at its end).
3. The drawing of metaphase 1



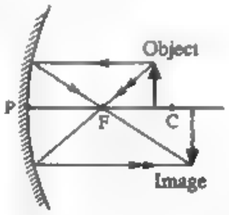
Metaphase I

27

1. Crossing over phenomenon.
2. It works on the variation of the genetic traits among the members of the same species.
3. Prophase 1 (at its end).

28

1.



2. The properties of the formed image, and its position :

   Real – inverted – magnified, at a distance greater than radius of curvature (double focal length).

29

1. Metaphase 1 – First meiotic division.
2. Anaphase 1.

30

1. The object moving with uniform speed.
2. The object is at rest.

31

1. Total distance = 50 + 100 + 50 + 100 = 300 m
2. Average speed = $\frac{\text{total distance}}{\text{total time}} = \frac{300}{140}$

   = 2.14 m/sec
3. Displacement = zero.

32

1. Both objects move with a regular speed.
2. V (of object A) = $\frac{4}{2} = \frac{2}{1} = 2$ m/sec.

   V (of object B) = $\frac{4}{4} = \frac{2}{2} = 1$ m/sec.

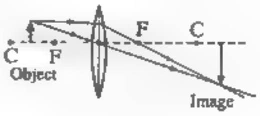
   V (A) : V (B) = 2 : 1

33

1. Fertilization – zygote.
2. The zygote contains the whole number of chromosomes which present in its species, and also its genetic trait comes from two sources (male gamete and female gamete).
3. Mitosis division.
4. (N).

34

The properties of the formed image : real, inverted and magnified.



35

1. $a = \frac{V_2 - V_1}{t} = \frac{25 - \text{zero}}{10} = 2.5 \text{ m/sec}^2$
2. It is a positive acceleration.

36

1. $V = \frac{5}{1} = \frac{10}{2} = \frac{15}{3} = \frac{20}{4} = 5$ m/sec.

   It's kind is a regular speed.

2. 3 seconds

3. 20 meters

Unit 1 Lesson 1: Motion in One Direction

- ✓ **Motion:**

It is the change of the position of a body as time passes relative to the position of another fixed object.

- ✓ **Speed:**

It is the distance moved through a unit time.

- ✓ **The two factors necessary for the description of speed are:**

The distance covered by the moving body.
The time taken by the moving body to cover this distance.

- ✓ **Speed (v)** $= \frac{\text{distance (d)}}{\text{time (t)}}$
- ✓ **Speedometer** help us to identify the speed of car, planes, etc.….
- ✓ **Average speed:**

It is the total distance covered by the moving object divided by the total time taken to cover this distance.

It is the regular speed by which the object moves to cover the same distance at the same period of time.

- ✓ **Average speed** $= \frac{\text{total distance}}{\text{total time}}$
- ✓ **Relative speed:**

It is the speed of a moving object relative to a constant or a moving observer.

- ✓ Measuring the relative speed depends on the **position of the observer.**

Science
is
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Choose the correct answer.

1- A moving car covers 500 m in 20 sec. so, its speed equals......
  a. 25 km/h.
  b. 20 km/h.
  c. 25 m/s.
  d. 20 m/s.

2- The two factors which are necessary for the description of motion are the ....
  a. weight and length.
  b. time and area.
  c. speed and time.
  d. distance and time.

3- Speed measurement unit is..................
  a. metre.second.
  b. metre/second.
  c. Metre^2/second.
  d. metre/second^2.

Write the scientific term.

1- The thing which moves with constant speed in the space. (...............................)

2- The change of object's position as time passes. (...............................)

Complete the following statements.

1- ....is a physical quantity which is used to describe and compare the motion of objects.

2- Distance = ...

3- A car which travels a distance of 180 km with a regular speed 90 km/h needs .... hours to cover this distance.

4- .... is defined as the covered distance within a unit time.

5- The movement of the body is described as regular when its ....speed is equal to its .... speed.

6- The measuring of relative speed depends on the.........................

7- Average speed = ...÷ ....

8- When the relative speed of a moving object is less than its real speed, therefore the observer moves in the .... direction of the moving object.

What is meant by...?

1- A car covers a distance 150 km in 3 hours.

………

2- A train moves at a regular speed 70 km/h.

………

3- The distance covered by a body is changed by 2 m each one second.

………

4- The body moves with a uniform speed.

………

5- The speed of a body equals zero.

………

6- The average speed of a moving car is 60 km/h.

………

7- The relative speed.

………

8- The relative speed of a moving object equals zero.

………

9- The body moves with irregular speed.

………

Give reasons for:

1- The motion of a train can be considered as a motion in one direction.

………

2- The object speed increases by decreasing the time needed to cover a certain distance.

………

3- It is difficult to measure the regular speed of a moving car practically.

………

4- A moving car seems to be at rest relative to an observer in another moving car beside it with the same speed and direction.

………

5- The train moves at an irregular speed.

………

Problems:

1- A moving object covers a distance 80 metres in 4 seconds then, it covers 120 metres in 6 seconds.

a. Calculate the speed of the object in each period.

b. Mention the kind of speed (giving reason).

……

……

2- Which of the following moves at a higher speed?

a. A train moves at 72 km/h.

b. A bird covers 20 metres in one second.

……

……

3- A plane moved from Aswan to Cairo in one hour. It covers a distance of 1000 km. Calculate the reading of the speedometer by (km/h & m/sec.) if you know that the plane moves with a regular speed.

……

……

4- Two cars move at the same moment and the same start position, the first car moves at speed of 90 km/h the second one moves at speed of 100 km/h.

Calculate the time difference between the arrivals of two cars to the end position which faraway the start position by 180 km.

……

……

5- A body moves by a average speed of 25 m/sec. through 5 sec. then it moves by a average speed of 22 m/sec. through 7 sec. Calculate:

a. The total distance covered by the body.

b. The average speed from the start motion to its end.

……

……

Unit 1 Lesson 2: Graphic Representation of Moving in a Straight Line

- ✓ **Physicists use other mathematical relation like graphs and tables.**

  In order to:

- Predict the relation between certain physical quantities.
- Understand practical results.
- Describe the physical phenomena in an easier way.

✓ **Acceleration:**

- It is the change of an object speed in one second in a specific direction.
- It is the rate of change of speed.
- Acceleration = $\frac{\text{final speed (V2 } \text{ V1)}}{\text{time } (\Delta t)}$
- Measuring units of acceleration: **m/sec^2 or km/h^2**

✓ **Uniform acceleration:**

It is the acceleration by which an object moves in a straight line when its speed changes by equal values through equal periods of time.

✓ **Positive acceleration:**

It is the acceleration by which an object moves in a straight line when its speed increases by equal values through equal periods of time. **(initial speed < final speed).**

✓ **Negative acceleration:**

It is the acceleration by which an object moves in a straight line when its speed decreases by equal values through equal periods of time. **(initial speed > final speed)**

- **Zero acceleration:**

(initial speed = final speed)

Complete the following statements.

1- The graphical relation (distance-time) for a uniform speed is represented by ……………………… line passing through the point of ……………………………

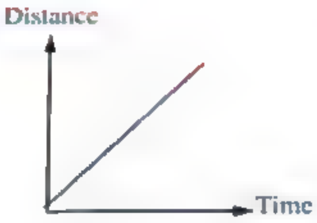
2- The graphical relation (speed-time) for a uniform speed is represented by a straight line ……………………… to the ……………………… axis.

3- The measuring unit of acceleration is ………………………

4- The motion of an object is described as a decelerating motion when its ……………………… speed is greater than its ………………………speed.

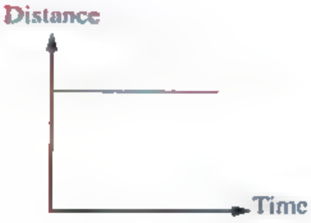
5- When the body moves from rest so, its initial speed equals …………………… and the body moves with ……………………… acceleration.

Describe the motion of the body in each of the following graphs.



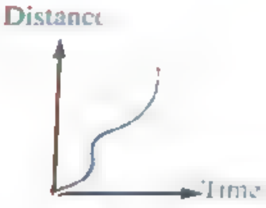
(1)

....



(2)

....



(3)

....

What is meant by...?

1- The ratio d/t for a moving body is constant.

....

2- The slope of the straight line in graphic relationship (distance-time) for a moving body =50.

....

3- A body moves at zero acceleration.

....

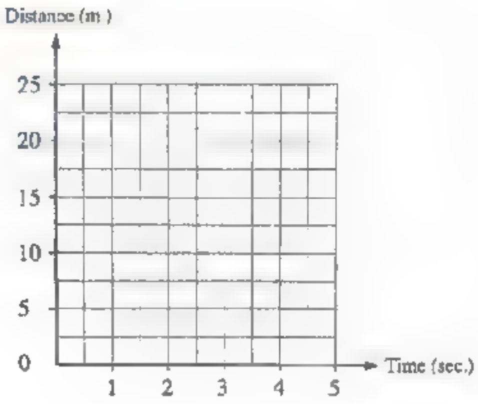
4- An object moves with negative acceleration equals 5 m/sec^2.

....

5- The initial speed of a moving body is less than its final speed.

....

Problems:

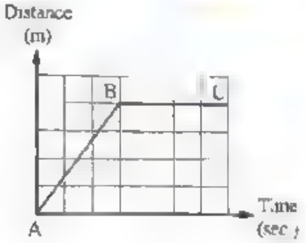


1- The following table represents the distances covered by a moving body through different time's intervals:

Distance (d)	5	10	15	20	25
Time (t)	1	2	3	4	5

a. Represent the relation graphically.
b. Calculate the speed from the graph.
c. Mention the kind of speed (giving the reason).

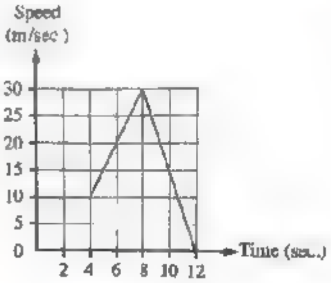
....



2- Study the opposite figure, then determine the time interval during which the body:

a. Is at rest: ……………………………………………………………………………………

b. Moves at a regular speed: ………………………………………………………………



3- The opposite graph represents the movement of an object. Calculate:

a. The distance that the object covered in the first four seconds.

……………………………………………………………………………………………………

b. The maximum speed that the object reaches during its movement.

……………………………………………………………………………………………………

c. The amount of acceleration that the object moves in the last four seconds. Mention its kind.

……………………………………………………………………………………………………

Choose the correct answer.

1- The acceleration (a) equals ……………………………

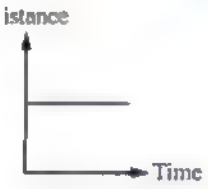
a. ΔV - Δt

b. ΔV x Δt

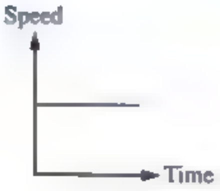
c. Δt / ΔV

d. ΔV / Δt

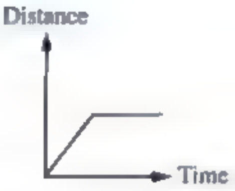
2- Which of the following graphs represents a body moves at zero acceleration?



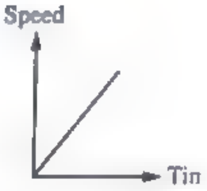
(a)



(b)



(c)



(d)

3- When an object moves with acceleration = zero, this means that the ……

a. speed is changed.

b. acceleration increases.

c. body moves with deceleration.

d. speed of the body is constant.

4- The relative speed of a moving object relative to an observer moves at the same speed in the opposite direction is .... the actual speed.

- a. double
- b. the same
- c. half
- d. quarter

5- It is said that the object moves at a uniform acceleration when ....

- a. its final speed is equal to its primary speed.
- b. its speed increases by equal amounts at equal times.
- c. it covers equal distances at equal times.
- d. no correct answer.

6- ....is the change of an object speed in one second.

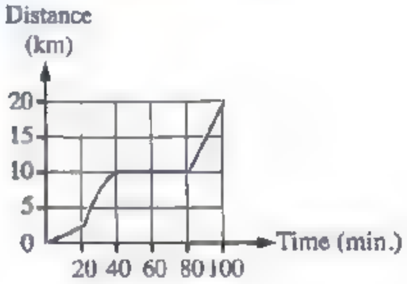
- a. Speed
- b. Acceleration
- c. Time
- d. Distance

7- If the uniform speed of a car is 72 km/h, so its speed in (m/sec.) equals.....................

- a. 20 m/sec.
- b. 25 m/sec.
- c. 18 m/sec.
- d. 40 m/sec.

8- The opposite graph represents the movement of a bicycle that got a hole in one of its tires and it took ....minutes to be repaired.

- a. 20
- b. 30
- c. 70
- d. 40



Unit 1 Lesson 3: Physical Quantities; Scalars and Vectors

✓ **Scalar physical quantity:**

It is the physical quantity that has magnitude only and has no direction. (mass, time, speed ……)

✓ **Vector physical quantity:**

It is the physical quantity that has magnitude and direction. (force, velocity, displacement……)

✓ **Distance:**

It is the actual length of the path that a moving object covers from the starting point to the ending point.

✓ **Displacement:**

It is the distance covered at a certain direction from the primary position of movement towards its final position.

✓ **Amount of displacement:**

It is the length of the shortest straight line between two positions (primary position and final position).

▪ Choose the correct answer.

1- Which of the following physical quantities are scalar quantities?................
- a. the radius and the area.
- b. the time and the force.
- c. the acceleration and the velocity.
- d. the mass and the displacement.

2- All of the following are vector quantities except the ....
- a. speed.
- c. displacement.
- d. force.
- b. acceleration.

3- All of these are from the examples of the scalar physical quantities except ....
- a. the force and the acceleration.
- b. the time and the mass.
- c. the mass and the speed.
- d. the time and the speed.

4- The shortest distance covered by a body in a certain direction is called the ....

a. distance.
b. displacement.
c. acceleration.
d. speed.

5- When an object moves in a direct straight line in one direction, therefore ....

a. distance > displacement.
b. distance = displacement.
c. distance < displacement.
d. displacement = zero.

- ## Give reasons for:

1- Speed is a scalar quantity, while velocity is a vector quantity.

....

2- Pilots take in consideration the velocity of wind.

....

- ## What is meant by...?

1- Scalar physical quantity.

....

2- Amount of displacement.

....

3- Vector physical quantity.

....

- ## Complete the following statements.

1-........................... is the rate of change of displacement, while .... is the rate of change of distance.

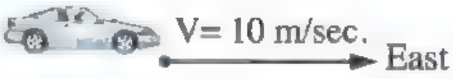
2- Average velocity =.................... ÷ ....

3- Physical quantities are classified into .... and ....

Problems:

1- From the opposite figure:

Calculate the displacement of the car after time equals:



a. 2 seconds.

b. 5 seconds.

……

……

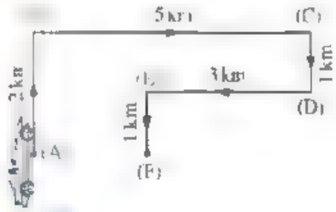
2- A hand-ball field in the form of a rectangle of 60 metres long and 40 metres wide. What is the amount of distance and displacement covered by a player moves around the field one complete cycle?

……

……

3- In the opposite figure, a car starts motion from point (A) to point (F) passing by points (B), (C), (D) and (E).

Calculate:



a. Total distance covered by the car.

……………………………………………………………………………

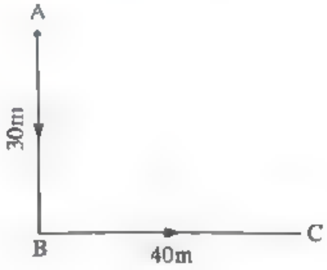
b. Displacement done by the car……………………………………………………………………………

c. Velocity if you know that the total time spent by the car equals 0.033 hours.

……

4- In the shown figure, a body began its movement from point (A) to the south till point (B) covering a distance of 30 m through 3 seconds, then to the east till point (C) which is 40 m far from point (B) through 4 seconds.

Calculate:



a. Distance and displacement covered by the body.

……………………………………………………………………………………

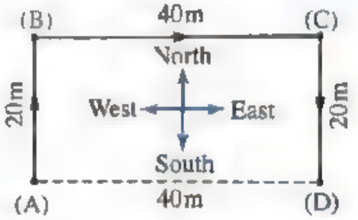
b. Average speed by which the body is moving.

……………………………………………………………………………………

……………………………………………………………………………………

5- From point (A), a body covered 20 metres northward within 10 seconds, then 40 metres eastward within 20 seconds, and then 20 metres southward within 10 seconds as shown in the figure.

Calculate:


(B)
40m
(C)
North
West
East
South
20m
20m
(A)
40m
(D)

a. The value of the total distance that the body covered.

....

b. Total time.

....

c. Average velocity.

....

d. What does the direct line between point (A) and point (D) represent? ....

Unit 2 Lesson 1: Mirrors

- ✓ **First law of reflection:**

Angle of incidence = Angle of reflection

- ✓ **Second law of reflection:**

The incident light ray, the reflected light ray and the normal line to the reflecting surface at the point of incidence all lie in one plane perpendicular to the reflecting surface.

- ✓ **The normal:**

is the perpendicular line to the reflecting surface on the point of incidence.

- ✓ **The incident light ray:**

is the light ray that falls on the reflecting surface.

- ✓ **Angle of incidence:**

is the angle between the incident light ray and the normal.

- ✓ **The reflected light ray:**

is the light ray that bounces (returns back) from the reflecting surface.

- ✓ **Angle of incidence:**

is the angle between the reflected light ray and the normal.

- ✓ **The plane mirror:**

is a piece of plane glass, painted from behind with a thin layer of silver metal to give the glass a bright surface that reflects the incident light rays that fall on it.

- ✓ **Concave mirror:**

is a mirror, whose reflecting (shining) surface is a part of the inner surface of the sphere.

- ✓ **Concave mirror is called converging mirror:**

As it converges (collects) the parallel light rays that falls on its surface.

- ✓ **Convex mirror:**

is a mirror, whose reflecting (shining) surface is a part of the outer surface of the sphere.

- ✓ **Convex mirror is called diverging mirror:**

As it diverges the parallel light rays that fall on its surface.

- ✓ **Concepts related to the spherical mirrors.**

1- Centre of mirror curvature (C):

It is the centre of the sphere that the mirror is considered as a part of it.

2- Pole of the mirror (P):

It is the point that lies in the middle of the reflecting surface of the mirror.

3- Radius of mirror curvature (r):

It is the radius of the sphere that the mirror is a part of it.

OR It is the distance between the centre of mirror curvature (C) and any point on its reflecting surface.

4- Principal axis of the mirror:

It is the straight line that passes by the pole of the mirror (P) and its centre of curvature (C).

5- Secondary axis of the mirror:

It is any straight line that passes by the centre of curvature of the mirror and any point on its reflecting surface except the pole of the mirror.

6- Focus of the mirror (F):

It is the point of collection of the reflected light rays.

7- Focal length of the mirror (f):

It is the distance between the focus of the mirror (F) and its pole (P).

$f = \frac{1}{2} r$

The position of the object from the concave mirror	The position of the image from the concave mirror	The properties of the formed image
1- Very far	At the focus.	▪ Real ▪ Very tiny
2- At a distance greater than the radius of curvature.	At a distance greater than the focal length, but less than the double of focal length.	▪ Real ▪ Inverted ▪ diminished
3- At a distance equals the radius of curvature.	At the centre of curvature (C).	▪ Real ▪ Inverted ▪ Equal to the object
4- At a distance greater than the focal length, but less than the radius of curvature.	After the centre of curvature (C).	▪ Real ▪ Inverted ▪ Magnified
5- At a distance less than the focal length.	Behind the mirror	▪ Virtual ▪ Upright ▪ Erect ▪ Magnified
6- At the focus.	No image is formed	- -

The position of the object from the convex mirror	The position of the image from the convex mirror	The properties of the formed image
At any place in front of the convex mirror.	Behind the mirror.	Virtual Erect Diminished

Complete the following statements.

1- The reflecting surface of the convex mirror is a part of ………………………surface of the sphere.
2- The radius of curvature of the convex mirror equals ……………………………. its focal length.
3- From types of mirrors are ……………………………. and ……………………………….
4- The image formed by a plane mirror for an object is …………………., reversed,……………………. and equals to the object in size.
5- The focus of the concave mirror is the point of collection of the ……………………… rays after being …………………from the mirror.
6- ………………………mirror diverges light rays, while ………………………mirror converges light rays.
7- A convex mirror has a focal length of 20 cm, then the radius of curvature of its spherical surface equals ……………………………..
8- When a body lies in front of a concave mirror at a distance…………………of its focal length, a real, smaller and ………………. image is formed.
9- A virtual, erect and enlarged image can be formed by ………………… mirror.

Choose the correct answer.

1- The rebounding of the light ray in the same medium when it meets a reflecting surface is known as the ……………………

a. incident light ray.
b. reflected light ray.
c. light reflection phenomenon.
d. light refraction phenomenon.

LET ME THINK...

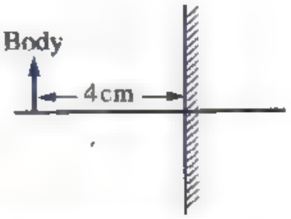
2- The straight line passing by the pole of the mirror and its centre of curvature represents ……………………

- a. the pole of the mirror.
- b. the secondary axis of the mirror.
- c. the principal axis of the mirror.
- d. there is no correct answer.

3- A spherical mirror whose radius of curvature equals 40 cm., its focal length equals……………….

- a. 10 cm.
- b. 20 cm.
- c. 40 cm.
- d. 80 cm.

4- If a body is put in front of a plane mirror as shown in the opposite figure:



(A) The distance between the image and the mirror surface is……………………..

- a. 2 cm.
- b. 3 cm.
- c. 1 cm
- d. 4 cm.

(B) If the mirror moves a distance of 1 cm in the direction of the body so, the distance of the image from the first image is ……………….

- a. 1 cm.
- b. 2 cm.
- c. 3 cm.
- d. 4 cm.

5- When an object is put in front of a concave mirror at the centre of mirror curvature, the properties of the formed image are…………………………

- a. real, inverted and small.
- b. real, inverted and equals to the object.
- c. real, inverted and magnified.
- d. virtual, erect and magnified.

6- If the position of the formed image of an object at a distance greater than the radius of curvature of a concave mirror, so the position of the object is ……………………

- a. at the centre of curvature.
- b. at a distance less than the focal length.
- c. between the focus and the centre of curvature.
- d. very far.

7- If a light ray falls parallel to the principal axis on a concave mirror, it reflects..........................
   a. passing through the centre of curvature of the mirror.
   b. passing through the focus.
   c. on itself.
   d. there is no correct answer.

8- If the focal length of a concave mirror equals 10 cm, to obtain a virtual image, the body is placed at a distance from the mirror pole equals ....
   a. 10 cm.
   b. 15 cm.
   c. 20 cm.
   d. 5 cm.

- ## Give reasons for:

1- The word AMBULANCE is written in a converted way on the ambulance car.

....

2- The perpendicular incident light ray on a plane mirror reflects on itself.

....

3- Concave mirror is used to generate high heat energy.

....

4- A convex mirror is put at the left side of the driver of the car.

....

5- The image formed by a convex mirror is always virtual.

....

- ## Put (√) or (x) in the front :

1- Focal length of the mirror = 2 × radius of mirror curvature.
(   )..

2- The straight line joining the object to its image is parallel to the surface of the plane mirror.
(   )..

3- Angle of incidence is the angle between the incident light ray and the normal.
(   )..

4. The centre of mirror curvature lies behind the reflecting surface in the concave mirror.
(   )..

Problems:

1- If the angle between the reflected light ray and the reflecting surface = 40°. Find the angle of incidence.

....

....

2- A person stands in front of a plane mirror at a distance of 10 metres. What is the distance he must move, so that the distance between him and his image can become 6 metres.

....

....

3- A. Show by drawing the path of rays which form an image in the following cases:

a. An object is put in front of a concave mirror at a distance equals the double of the focal length.

b. An object is put in front of a concave mirror at a distance less than the focal length.

Unit 2 Lesson 2: Lenses

✓ **Lens:**

It is a transparent medium that refracts the light and it is limited with two spherical surfaces.

✓ **Convex lens (converging lens):**

It is a transparent optical piece which is thick at its centre and less thickness at the tips.

✓ **Concave lens (diverging lens):**

It is a transparent optical piece which is thin at its centre and more thickness at the tips.

✓ **Convex lens is called converging lens,** as it collects light rays falling on it.

✓ **Convex lens is called converging lens,** as it collects light rays falling on it.

✓ **Special concepts related to the lenses**

1- Centre of curvature of the lens face (C) :

It is the centre of the sphere, where this face is a part of it.

2- The optical centre of the lens (P):

It is a point inside the lens that lies on the principal axis in the mid distance between its two faces.

3- Radius of curvature of the lens face (r):

It is half the diameter of the sphere, where this face is a part of it.

4- The principle axis:

It is the straight line that joins between the two centres of curvatures of the lens passing by the optical centre of the lens.

5- The secondary axis:

It is any line passes by the optical centre of the lens except the principle axis.

6- The focus of the lens (F) (principle focus):

It is the point of collection of the refracted light rays.

7- The focal length of the lens (f):

It is the distance between the principle focus and the optical centre of the lens.

$f = \frac{1}{2} r$

The position of the object from the concave lens	The position of the image from the concave lens	The properties of the formed image
At any place in front of the concave lens.	The image is formed nearer to the object position, and in its same side.	▪ Virtual ▪ Erect ▪ Diminished

The position of the object from the convex lens	The position of the image from the convex lens	The properties of the formed image
1- Very far	At the focus.	▪ Real ▪ Very tiny (dot)
2- At a distance greater than double focal length.	Between the focus and the centre of curvature.	▪ Real ▪ Inverted ▪ diminished
3- At a distance equals the radius of curvature.	At the centre of curvature (C).	▪ Real ▪ Inverted ▪ Equal to the object
4- At a distance greater than the focal length, but less than the radius of curvature.	After the centre of curvature (C).	▪ Real ▪ Inverted ▪ Magnified
5- At a distance less than the focal length.	The image is formed farther than the object position, and in its same direction.	▪ Virtual ▪ Upright ▪ Erect ▪ Magnified
6- At the focus.	No image is formed.	- -

✓ **Short-sightedness:**

It is a vision defect through which near objects only can be seen clearly but far objects seem distorted. **Due to:**

- The increase in the eyeball diameter ---> this causes the retina to be far from the eye lens.
- The increase in the convexity of the eye lens surface. ---> this causes a shorter focal length for the eye lens.

✓ Long-sightedness:

It is a vision defect through which far objects only can be seen clearly but near objects seem distorted. **Due to:**

- The decrease in the eyeball diameter. ---> this causes the retina to be close from the eye lens.
- The decrease in the convexity of the eye lens surface. ---> this causes a longer focal length for the eye lens.

Complete the following statements:

1- The lens is a ……………….medium that ……………. the light and is limited with two spherical surfaces.

2- There are two types of lenses which are …………… and ………………

3- The incident light ray that passes through the ……………. of the convex lens, it exits from the lens parallel to the ………………

4- If an object is put in front of a convex lens at a distance greater than the double of the focal length, so the image is formed between the ……………..and the ……………

5- The convex lens ………………..light rays, while the convex mirror ………………light rays.

6- The incident light ray that is parallel to the principal axis of the convex lens, it penetrates the lens passing through ……………………….

Choose the correct answer:

1- If the radius of curvature of a lens equals 20 cm, so its focal length equals…………………

a. 5 m.
b. 10 cm.
c. 20 cm.
d. 10 m.

2- A convex lens is placed in the passage of sun rays, a very small real image for the Sun is formed at a distance of 20 cm. from the optical centre of the lens, if this lens is used to form virtual, upright and enlarged image for another body. Which of the following distances from the optical centre is correct?

a. 10 cm.
b. 20 cm.
c. 40 cm.
d. 50 cm.

3- Lenses are used in ……………………

- a. cameras.
- b. medical glasses.
- c. binoculars.
- d. all the previous things.

4- The optical piece that forms a real image and equals to the object is the ……………………

- a. convex mirror.
- b. plane mirror.
- c. convex lens.
- d. concave lens.

5- The properties of the formed image of a body placed at a distance less than the double of focal length, but more than the focal length of the convex lens are ……………………

- a. virtual and enlarged image.
- b. real and enlarged image.
- c. real and diminished image.
- d. no correct answer.

6- If the focal length of a concave lens is 6 cm, so the radius of curvature is ……………………

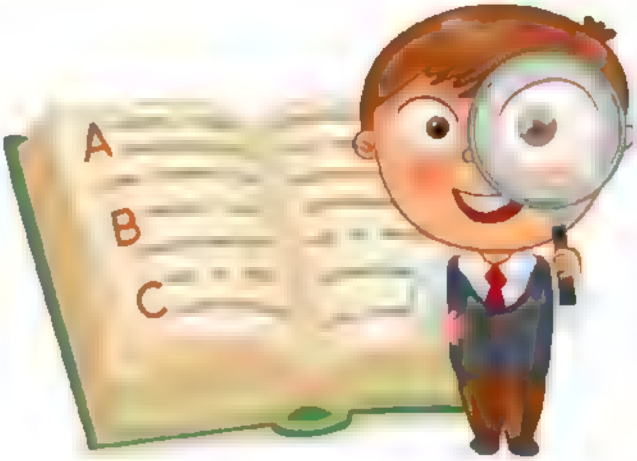
- a. 3 cm.
- b. 6 cm.
- c. 9 cm.
- d. 12 cm.

7- Virtual image is formed by ……………………

- a. plane mirror.
- b. concave lens.
- c. convex mirror.
- d. all the previous answers.

8- The normal person sees the near objects at a distance ……………………

- a. not less than 25 cm.
- b. less than 25 cm.
- c. more than 6 cm.
- d. no correct answer.



9- The erect images in the mirrors and lenses are ……………………images.

a. virtual
b. real
c. real or virtual
d. no correct answer

10- The reasons of long-sightedness are ……………………

a. the decrease of eyeball diameter.
b. the decrease of convexity of e eye surface.
c. the close images are formed behind the retina.
d. all the previous answers.

- ## Give reasons for:

1- The concave lens is called diverging lens.

……

2- No image is formed for the object that is located at the focus of the convex lens.

……

3- Lenses have two centres of curvature.

……

4- It is impossible to obtain a real image by using a concave lens.

……

5- The contact lenses are called by this name.

……

6- Some persons have short-sightedness.

……

- ## Put (✓) or (x) in the front :

1- Eye lens is a concave lens.
(   )………
2- The image formed by the concave lens is always virtual.
(   )………
3. Contact lenses stick to the eye cornea by the eye fluid.
(   )………
4. Illness and old age are from the reasons of the cataract disease.
(   )………

- **What is meant by…?**

1- The principal axis of a lens.

……………………………………………………………………………………………………

2- The focal length of a convex lens is 5 cm.

……………………………………………………………………………………………………

3. The centre of curvature of the lens face.

……………………………………………………………………………………………………

- **Compare between long-sightedness and short-sightedness:**

Points of comparison	Long-sightedness	Short-sightedness
Definition		
The position of the formed image		
Treatment		

- **Mention the most important uses of lenses.**

……………………………………………………………………………………………………

……………………………………………………………………………………………………

- **Problems:**

1- A body of length 4 cm is placed at a distance of 6 cm from a convex lens, its focal length is 3 cm.

a. Draw a diagram to show the path of the rays falling on the lens and the refracted ones from it.

b. Mention the properties of the formed image.

……………………………………………………………………………………………………

c. Mention the length of the image and the radius of the lens.

……………………………………………………………………………………………………

Unit 3 Lesson 1: The Universe and the Solar System

✓ **The universe:**

It is the wide and extended space that contains all the galaxies, stars, planets, moons, living organisms and everything.

✓ **Galaxies:**

They are groups of stars that rotate together in cosmic space by the effect of gravity.
OR, They are the greatest units that form the universe.

✓ **The Milky Way Galaxy:**

It is the galaxy to which our solar system belongs.
The old stars (the older stars) gather in the centre surrounded by the small stars (the recent age) are located in the spiral arms of the galaxy.

✓ **The solar system:**

It contains the sun and eight planets revolving around the sun.

✓ The force of gravity is responsible for keeping the planets in their orbits around the sun and the moons in their orbits around planets.

✓ **Light year:**

It is the distance covered with light in one year and it equals 9.46×10^{12} km.

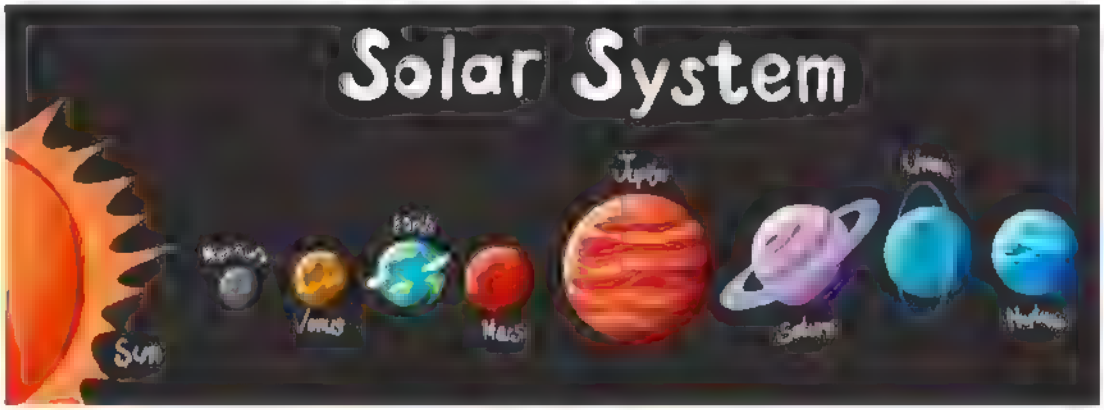
✓ The distances between galaxies increase as time passes, as galaxies move away from each other in the cosmic space.

✓ **Expansion of the universe:**

It is the continuous separation between galaxies in space as a result of their regular movement.

✓ **Big bang:**

It is a theory that explains the origin of the universe from a massive explosion since 15000 million years and resulted in it all forms of matter, energy, time and space followed by continuous expansion and changing processes.



- ✓ The Nebular theory assumed that the origin of the solar system was the nebula.
- ✓ **Nebula:**

It is a glowing gaseous sphere revolving around itself, from which the solar system was originated.

- ✓ The crossing star theory assumed that the origin of the solar system was a big star which is the sun.
- ✓ **Star explosion phenomenon:**

Glowing of a star for a short time to become one of the most shining stars in the sky, then its glowing disappears gradually to return as it was.

- ✓ The modern theory of the world assumed that the origin of the solar system was a star rather than the Sun.
- ✓ Astronomers use special equipments centered on the Earth as the solar telescope or carried into space as Hubble telescope in order to study the Sun.

▪ Write the scientific term for each of the following:

1- The wide and extended space that contains all the galaxies, stars, planets and everything.

(……………………………………………)

2- Groups of galaxies that rotate in the cosmic space.

(……………………………………………)

3- The Sun and eight planets revolving around it.

(……………………………………………)

4- A theory explains the origin of the universe due to a massive explosion followed by continuous expansion and changing processes since 15000 million years.

(……………………………………………)

- **What will happen if there is no attraction force between the Sun and the Earth?**

……

……

- **Complete the following statements:**

1- Stars rotate around the centre of the ………………………, while planets rotate around the ……………………

2- The distances between stars are measured in ……………… unit and it equals ………………………km.

3- As the distance between the planet and the Sun increases, the Sun gravity ………………… and its motion becomes …………………

4- After ……………………… million years from the Big Bang, our galaxy took its disc form, while the Sun was born after ……………………… million years from the Big Bang.

5- The universe originated from a gaseous ball of ……………………pressure and ……………… volume.

6- In Milky Way galaxy, the old stars gather in the …………………………of the galaxy, while small stars are located in the ……………………… arms of the galaxy.

7- The founder of nebular theory about the evolution of the solar system is ………………………

8- Over the time, the nebula lost its heat gradually so, its volume ………………… and its revolving speed around itself …………………

9- The theory that assumed that the solar system was a glowing gaseous sphere is …………………

10- The explosion of the expanded part from the Sun towards the crossing star led to formation of …………………… line of a great length and the …………………escaped from the gravity of the crossing star.

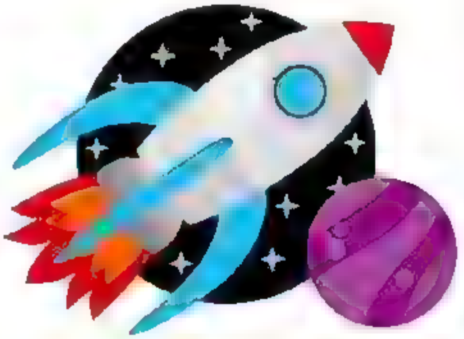
11- The solar system was originally …………………… according to the crossing star theory, while according to modern theory, it was originally……………………………

12-………………………… is from telescopes that are centered on the Earth, while ………………………… is from telescopes that are carried into space.

- **Choose the correct answer:**

1- The biggest star that can be seen clearly by people on the Earth is …………………

a. Saturn.
b. the Sun.
c. Uranus.
d. Neptune.



2- The Sun takes about ……………… million years to complete one rotation around the centre of the galaxy.

a. 15000
b. 220
c. 50
d. 22

3- The volume of the universe ……………………… up till now.

a. is constant
b. contracts
c. expands
d. contracts and expands

4- Earliest life forms began to appear on the Earth after……………. years from the Big Bang.

a. 3000 million
b. 12000 million
c. 15000 million
d. 17000 million

5- The gases which produced galaxies, stars and universe are ………………………

a. oxygen and helium.
b. oxygen and carbon dioxide.
c. hydrogen and helium.
d. hydrogen and carbon dioxide.

6- The theory which explains how the universe originated is ………………………….theory.

a. Crossing star
b. Nebular
c. Solar system
d. Big Bang

Correct the underlined words:

1- Within minutes of the explosion of Big Bang, the percentage of **helium** gas was 75%.
(……………………………………………)

2- Galaxies began to form after **5000** million years from Big Bang.
(……………………………………………)

3. Each galaxy has a distinctive shape according to the harmony and order of the groups of **planets** in it.
(……………………………………………)

Give reasons for:

1- Our galaxy is called by the Milky Way.

....

2- The continuous expansion of the cosmic space.

....

3- The stability of the Earth rotation in an orbit around the Sun.

....

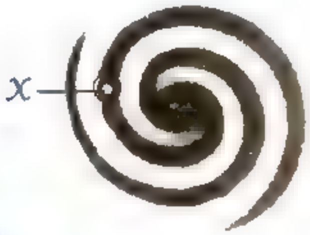
4- Explosion of some stars suddenly.

....

5- The nebula lost its sphere form and became in a form of a flat rotating disc.

....

Study the opposite figure, then answer:



1- What's the galaxy which our solar system belongs to?

....

2- What does point (X) refer to?

....

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SCIENCE

Unit 4 Lesson 1: Cell Division

- ✓ **Chromosomes:**

They are thread like bodies present in cells, nuclei and they represent the genetic material of the living organisms.

- ✓ **The chromosome consists of:**
  - Two connected threads, each thread is called "**chromatid**"
  - The two chromatids are connected at a point known as "**centromere**"
- ✓ **Centromere:**

It is the point of connection of the two chromatids of chromosome.

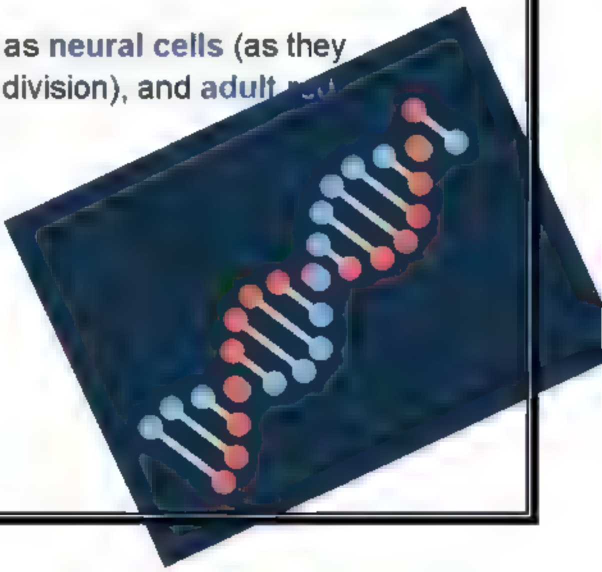
- ✓ **The chromosome consists of:**
  - A nucleic acid called "DNA" which carries the genes that carry the genetic traits of the living organism.
  - Protein.
- ✓ **DNA:**

It is the nucleic acid that carries the genetic traits of the living organism.

- ✓ **Somatic cells and reproductive cells,** each one of them contains a **complete number of chromosomes " diploid number 2N"**
- ✓ **Gametes** (male gametes "sperms" and female gametes "ova"
  Each one of them contains a **half number of chromosomes** present in reproductive cell or in somatic cell." **haploid number N"**
- ✓ **Importance of chromosomes:**
  - They represent the genetic material of the living organism.
  - They have the main role in cell division.
  - Knowing the number of chromosomes helps in identifying the animal and plant species.
- ✓ **Mitotic cell division (mitosis):**

It is a kind of cell division that occurs in the somatic cell, at which the cell divides into **two new cells** (somatic cells), each of them contains the same number **(diploid number)** of chromosomes of the parent somatic cell.

- ✓ Some cells in human body are not divided at all, such as **neural cells** (as they **don't contain centrosome,** which plays a role in cell division), and **adult red blood cells** (as they **don't contain nucleus**)
- ✓ **Importance of mitosis:**
  - Compensation of damaged cells.
  - Completing the asexual reproduction process.
  - Growth of living organisms.



✓ **Meiotic cell division (meiosis):**

It is a kind of cell division that occurs in the reproductive cells, at which the cell divides into **four new cells** (gametes), each cell contains half number **(haploid number)** of chromosomes of the parent reproductive cells.

✓ **Importance of meiosis:**

Production of male gametes and female gametes to complete the sexual reproduction.

✓ **Crossing over phenomenon:**

It is a phenomenon that takes place at the end of prophase I in which some parts of two inner chromatids of each tetrad are exchanged to produce new genetic arrangements.

✓ **Tumor:**

The mass of cells produced due to abnormal continuous division of cells.

▪ Write the scientific term for each of the following:

1- The point of connection of the two chromatids together.
(...)
2- It consists of two chromatids connected together at centromere.
(...)
3- The phase in which the cell prepares itself to divide by duplicating the genetic material.
(...)
4. The phase in which the chromosomes are arranged at the equator of the cell during its division.
(...)

▪ Correct the underlined words:

1. Chromosomes arranged along the cell equator in the **anaphase.**
(...)
2. The number of chromosomes in somatic cells is a **haploid** number.
(...)
3. The nucleolus disappears during the mitotic cell division in **telophase.**
(...)

▪ Complete the following statements:

1- The number of chromosomes in the living organisms is ....from a species to another, while it is............................ in members of the same species.
2- .... and..................................are two types of cell division.

3- The ………………………….contains the genetic material which consists of a number of ………………………… that have the main role in cell division.

4- The human body contains two types of cells, which are …………………… and ……………………..

5- In human, all somatic cells contain …………………. chromosomes, while the gametes contain …………………………..chromosomes.

6-……………………… division happens in somatic cells and it leads to the growth of the living organism.

Give reasons for:

1- Cellular division begins with interphase.

………

2- Shrinking of spindle fibers during the anaphase of mitotic cell division.

………

3- The meiotic division is considered as a source for genetic variation on which the variation of living organisms depends on.

………

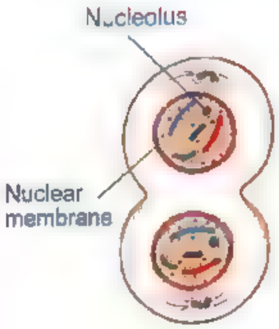
4- Mitotic division differs from second meiotic division although they are similar in their phases.

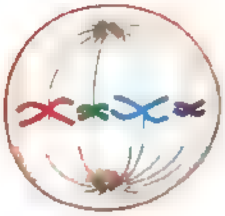
………

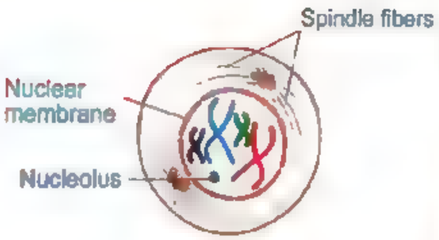
5- Nanotechnology is called by this name.

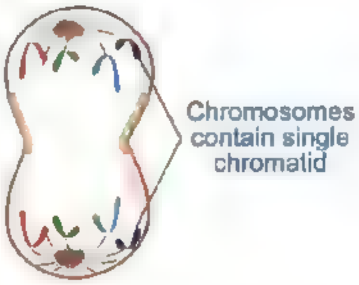
………

Name only these stages of mitosis:


Nucleolus
Nuclear membrane




Spindle fibers
Nuclear membrane
Nucleolus


Chromosomes contain single chromatid

………………………… ………………………… ………………………… …………………………

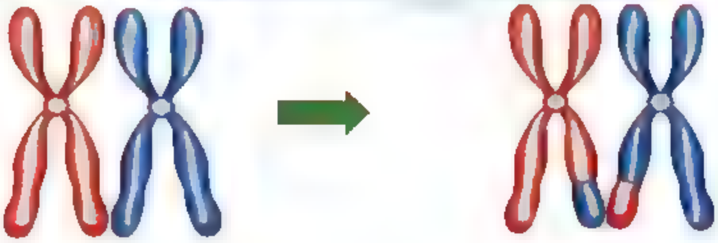
- **Choose from column (B) what suits in column (A):**

(A)	(B)
1- Centromere	a- Divide mitotically.
2- Somatic cells	b- Don't divide at all.
3- Gametes	c- It is the point of connection of the two chromatids.
4- Neural cells	d- Contain half number of chromosomes.

- **Compare between:**

Points of comparison	Mitotic cell division	Meiotic cell division
The site of occurrence		
The number of chromosomes in the resulted cells		

- **Explain the following phenomenon and state what is importance:**



……

……

Choose the correct answer:

1- If the skin cells in man contain 46 chromosomes, so the sperms of the male contain ……………… chromosomes.

a. 23
b. 32
c. 46
d. 64

2- In the first meiotic division, the cell divides to form ……………………..cells.

a. two
b. four
c. six
d. eight

3- Meiotic cell division is responsible for the ……………………..

a. growth of organisms.
b. compensation of damaged cells.
c. production of gametes.
d. duplication of cells number.

4. Gametes resulted from the ……………………..cell division.

a. reduction
b. meiotic
c. mitotic
d. (a)&(b) are correct.

Put (√) or (x) in the front :

1- Second meiotic division aims to form two cells, each of them contains half number of chromosomes.
(   )………

2- DNA is duplicated only once during meiosis.
(   )………

3- Mitotic cell division is called by reduction division.
(   )………

4- Gametes in living organisms are produced by special cells known as the somatic cells.
(   )………

5- Mitotic division produces cells that contain half of the genetic material.

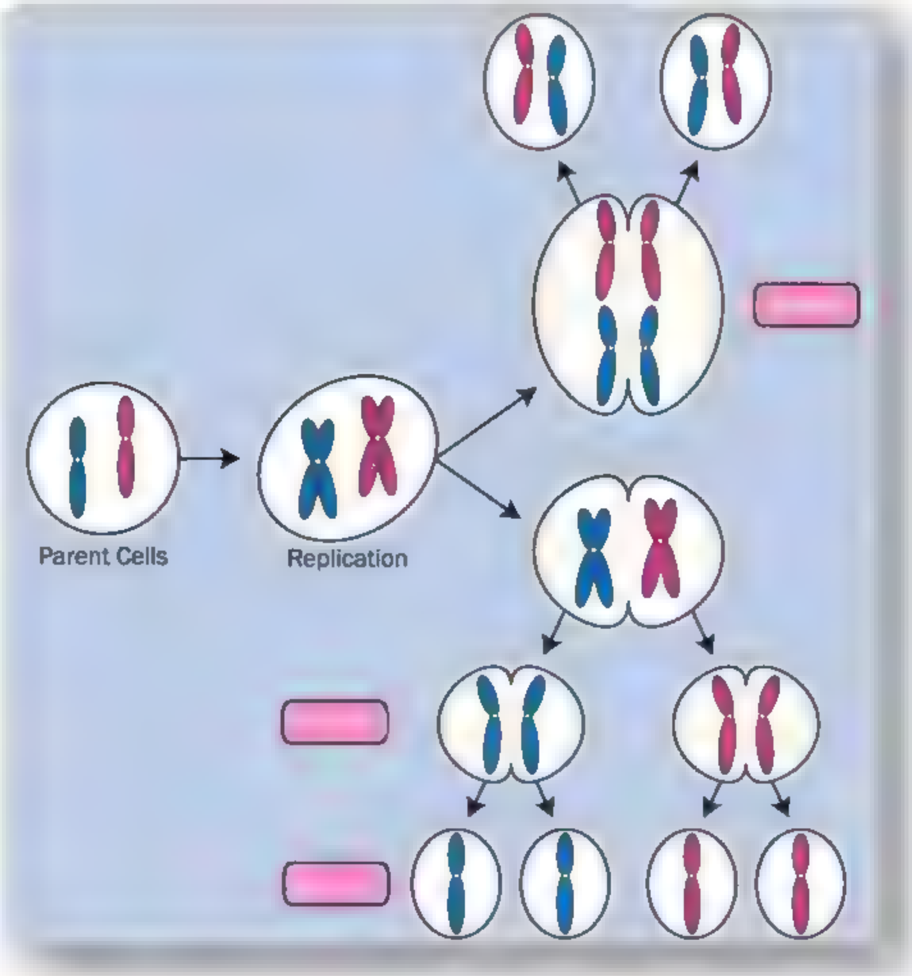
( )………

6- Reproductive cells are divided by mitosis which leads to the formation of gametes.

( )………

7- Crossing over occurs in the telophase in the first meiosis.

( )………



Unit 4 Lesson 2: Sexual and Asexual Reproduction

✓ **Reproduction process:**

It is a biological process, where the living organism produces new individuals of the same kind and thus, ensuring continuity.

✓ **Asexual reproduction:**

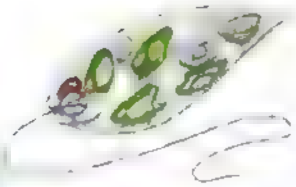
It is a process by which a living organism produces new individuals with genetic traits identical to those of their parent.

✓ **Properties of asexual reproduction:**

- It takes place by only one living organism.
- It doesn't require special systems or structures in the living organism
- It takes place by mitotic division.
- It keeps the genetic structure of living organism.

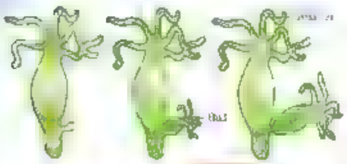
✓ **Reproduction by binary fission:**

It is a type of asexual reproduction where the nucleus divides mitotically, then the cell splits into two identical cells.



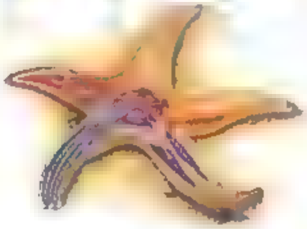
✓ **Reproduction by budding:**

It is a type of asexual reproduction that produces new individuals by formation of buds in the parent cell.



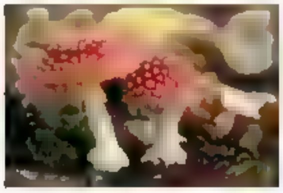
✓ **Reproduction by regeneration:**

It is the ability of missing part in some living organisms to grow forming a complete organism identical to the parent individual.



✓ **Reproduction by spore propagation:**

It is a type of asexual reproduction that occurs in some fungi and algae by producing spores.



✓ **Vegetative reproduction:**

It is a type of asexual reproduction that takes place in plant's vegetative organs without the need of seeds.

- ✓ **Sexual reproduction:**

It is a process by which a living organism produces new individuals with traits differ from parents.

- ✓ **Properties of sexual reproduction:**
  - It occurs between two parental individuals, one of them is a male and the other is a female.
  - It takes place by special reproductive organs and systems
  - It takes place by meiotic division.
  - It doesn't keep the genetic structure of living organism.
- ✓ **Fertilization:**

It is the combination of a male gamete (N) and a female gamete (N) to form a zygote (2N).

- ✓ **Zygote:**

It is a cell produced due to fertilization and it contains the complete number (diploid number) of chromosomes of the living organisms.

▪ Write the scientific term for each of the following:

1- It is formed as a result of the combination of the male gamete and the female one.
(……………………………………….)
2- The combination of the male gamete and the female gamete to form a new structure.
(……………………………………….)
3- The most common asexual reproduction in fungi and algae.
(……………………………………….)

▪ Give reasons for:

1- Sexual reproduction is a source of the genetic variation.

………

2- Asexual reproduction produces offspring with genetic traits identical to those of their parents.

………

3- Binary fission is considered as mitotic division.

………

- **Correct the underlined words:**

1- The yeast fungus reproduces by **regeneration.**

(…………………………………………)

2- Sexual reproduction takes place in plants through **spores.**

(…………………………………………)

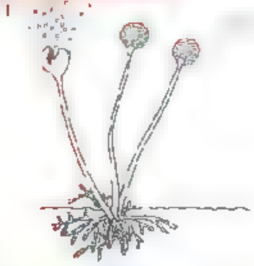
3- Euglena can reproduce asexually by **budding.**

(…………………………………………)

4- **Sexual reproduction** maintains the genetic structure of the living organism.

(…………………………………………)

- **Look at the opposite figure, then answer the following questions:**



1- Label the figure.

1- ……………………………

2- ……………………………

2- What's the way of the reproduction of this fungus?

………

3- What does happen when no. 1 falls on a suitable environment?

………

- **Complete the following statements:**

1- Asexual reproduction in the bacteria happens by …………………while in hydra by ……………………..

2- In reproduction process, the …………………… move from parents to their offspring.

3- When the bud remains connected to the parental cell, a ………………………..is formed.

4- During asexual reproduction, the number of parents…………………………. is while during sexual reproduction is ……………………….

5- ………………………. and ………………………. are from the forms of asexual reproduction.

Choose the correct answer:

1- Sexual reproduction depends on the ....

a. formation of gametes only.
b. meiotic division of reproductive cells only.
c. fertilization only.
d. all the previous choices.

2- The ability of some animals to compensate their missing parts is called ....

a. regeneration.
b. budding.
c. forming spores.
d. sexual reproduction.

3- If the number of chromosomes in cells of starfish is (2N), the number of chromosomes in resulted cells after reproduction is ....

a. N
b. 2N
c. ½ N
d. d. no correct answer

4-.................................. contains half the genetic material of the individual.

a. Sperm only
b. Ovum only
c. Zygote only
d. (a) and (b)

علوم مع غادة صلاح

Final revision Science Prep.3 t①

1

1 Write the scientific term	What is meant by ? define
① It is the phenomenon of the Light bouncing of (returning back) in the same medium, when it strikes a reflecting surface.	1 The Light reflection phenomenon
② It is the total distance covered by the moving object divided by the total time taken to cover this distance.	2- Average speed
③ It is a biological process, Where the Living organism produces new individuals of the same Kind and thus, ensuring its continuity.	3- reproduction
④ The covered distance at certain direction	4- Displacement
⑤ the value of change of an object's speed in one second.	5- Acceleration
⑥ The angle between the reflected light ray and the perpendicular line on the reflecting surface from the point of incidence	6- reflecting angle.
⑦ The Ability of some animals to compensate their missing parts.	7- regeneration
⑧ Physical quantity which has magnitude only and has no direction.	8- Scalar Physical quantity
⑨ Change of an object position as time passes according to the position of another object.	9 - motion

what is meant by ? define

1 write the scientific term.

(10) The distance covered at a certain direction from the primary position of movement towards its final position.	10-Displacement
(11) The distance between principle focus and optical centre of the lens.	11- focal length
(12) The process of exchanging the two inner parts of chromatids of each tetrad.	12- crossing over phenomenon
(13) It is the wide and extended space that contains galaxies.	13- Universe
(14) The space which contains the galaxies, stars, planets, moons and all living organisms.	14- the universe
(15) The ability of the missing part in some living organisms to grow forming a complete organism identical to the parent individual.	15- reproducing by regeneration
(16) The speed of a moving object relative to a standing or a moving observer	16- Relative speed.
(17) A spherical mirror its shining surface is a part of the outer surface of the sphere.	17-convex mirror
(18) Millions of the star which arranged in a distinctive shape.	18- Galaxy
(19) * special organs for reproduction in algae and fungi * Sacs are carried by a lot of fungi and contain a large number of spores.	19- sporangia

① write the scientific term	(define) what is meant by ?
(20) Asexual reproduction occurs by different parts of the plant without needing seeds.	20 - Vegetative reproduction
(21) The actual length of the path that a moving object covers from the starting point to the ending point.	21 - distance
(22) Thread like bodies present in the cell's nuclei and they represent the genetic material of the Living organism.	22 - chromosomes
(23) An optical piece that is used to treat a vision defect which causes the formation of image in front of the retina.	23 - concave Lens
(24) It is a very thin lens made of plastic, and can stick to the eye cornea by the eye fluid.	24 - contact lens
(25) The rate of change of the distance.	25 - speed.
(26) The image that cannot be received on a screen	26 - Virtual image.
(27) An apparatus is used to see the tiny bodies that cannot be seen by the naked eye.	27 - microscope.
(28) The point of connection of two chromatids of the chromosome together	28 - centromere

Define
what(is) meant by?

① write the scientific term

(29) They are the arrangement of homologous pairs of chromosomes, where each pair consists of 4 chromatids.	The tetrad.
(30) A point inside the lens that lies on the principal axis in the mid distance between its faces.	30- optical centre
(31) fibers extend between the two poles of the cell in prophase	31- spindle fibers
(32) The continuous separation between galaxies in the universe due to their regular motion.	32- continuous expansion of the universe
(33) A pair of connected threads at the centromeres in a chromosome	33- Chromatids
(34) The line that passes through the center of curvature of the mirror and its pole	34- principal axis
(35) The displacement covered in a unit time $\left(\frac{\text{displacement (Km or m)}}{\text{total time (hour or second)}}\right)$	35- velocity
(36) An eye disease because of old age that causes a difficulty of vision as a result of the darkness of the lens.	36- cataract
(37) It is a glowing gaseous sphere revolving around itself, from which the solar system was originated.	37- Nebula

1 write the scientific term	What is meant by? (define)
(38) The regular speed by which the moving object moves to cover the same distance at the same period of time.	38- average speed
(39) The length of the shortest straight line between two positions	39- the amount of displacement
(40) The cells formed from reproductive cell inside living organisms by meiotic division	40- Gametes
(41) The force that controls in the orbits of planets around the sun.	41- Gravity of the Sun
(42) It is The combination of male gamete and female gamete to Form Zygote	42- fertilization
(43) A speed in which an object covers equal distances at unequal periods of time	43- Irregular speed
(44) The phase in which the cell is prepared for division by the occurrence of Some important biological processes and the duplicate of genetic material (DNA)	44- Interphase
(45) It is The acceleration by which an object moves in a straight line when its speed changes by equal values through equal periods of time.	45- Uniform acceleration
(46) * A vision defect is formed (as) a result in the shortness of the radius of the ball thus the retina is close to the eye lens. * Seeing far objects clearly and seeing the near objects distorted.	46- long-Sightedness

1 write the scientific term	what is meant by? Define
(47) A unit is used to measure the distance between celestial bodies in the universe	47- Light year
(48) It ____ is a Kind of reproduction that involves (two) Living organisms, one of them is a male and the other is a female.	48- Sexual reproduction
(49) The point of collection of the parallel light rays after refraction from the lens.	49- the focus of the convex lens
(50) A cell that produced due to fertilization and it contains the complete number of chromosomes of the Living organism.	50- the Zygote
(51) Angle of incidence equal angle of reflection.	51- First Law of light reflection
(52) It is the point in the middle of its reflecting surface.	52- The Pole of the mirror
(53) Glowing of a star for short time to become one of the most shining stars in the sky, then its glowing disappears gradually to return as it was.	53- star explosion phenomenon.
(54) A Theory explains the origin of the Universe due to emerged from the particles of helium and hydrogen gases, since 15000 million years.	54- Big bang theory

1 write the scientific term

(55) The upright image that cannot be received on a screen.	55_ virtual image
(56) An optical piece thick at its middle and thin at the terminals.	56_ convex lens.
(57) A type of reproduction depends on one parent without production of gametes	57- Asexual reproduction
(58) A mirror, always forms(small) image for the object.	58_ convex mirror
(59) It contains the sun and the solar system	59 Milky way galaxy.
(60) The part which is responsible for pulling the chromosomes towards the two poles of the cell during anaphase of cell division	60- spindle fibers
(61) The acceleration by which an object moves when its final speed is less than its initial speed.	61- deceleration
(62) A flat gaseous rounded disk that formed the planets of the solar system.	62- the nebula
(63) specialized cells which produce gametes	63- reproductive cells
(64) Cellular division which leads to the formation of gametes	64- meiosis
(65) which have the main role in cell division	65- Nucleus
(66) located in one of the spiral arms of the milky way galaxy	66- solar system.

② What is meant by each of the following ?

1) The average speed of a moving car is 60 Km / hour.
- The total distance covered during one hour equals 60 Km.

2) Angle of reflection of the light ray = 40°.
- The angle between the reflected light ray and the normal equals 40°.

3) Sexual reproduction.
It occurs in most higher living organisms through (2) living organisms, one of them is male and the other is female.

4) the focal length of a concave mirror is 7cm.
- The distance between the focus and the pole of the mirror equals 7cm.

5) An object moves with uniform acceleration equals $10 \, m/s^2$.
The speed of the object is changed by 10 m/s each one second.

6) The distance between pole of a spherical mirror and its primary focus is 10cm.
- The focal length equal 10cm.

7) The relative speed of car relative to a moving observer equals zero. - Both car and observer move with the same speed and direction.

8) Meiosis division is a reduction division.
The produced gametes contains half the number of chromosomes in the reproductive cell.

2 complete the following sentences:

1) The image can be received on a screen is called .... image.	1) real
2) At the end of ...., the nucleolus and the nuclear membrane disappear at the mitotic division.	2) prophase
3) The sun Takes about 220 million years to complete one cycle around the center of	3) galaxy
4) The chromosome consists of two connected threads at the ...., each is called	4) centromere - chromatid
5) When object speed decreases by passing time, then it moves (at) .... acceleration.	5) negative
6) If the focal length of a convex mirror is (10 cm) then its radius of curvature of its reflecting surface equal	6) 20 cm
7) the .... division occurs in liver cells	7) mitosis
8) The image always equals the object and can't be formed on a screen in the .... mirror.	8) plane
9) In case of the .... division of the cells no changing in the genetic traits.	9) mitosis
10) The scientist who establish the crossing star theory that explains the origin of the solar system	10) ChamberLain and Moulton
11) The ability of the liver to regenerate under certain conditions if injured represents the scientific base for .... surgery.	11) Liver transplantation

9 Complete

12) The device that is used by the astronomers to identify the different wave lengths emitted by the Sun, centered on Earth(is)...	12) Solar telescope.
13) As the distance between the planet and the Sun increases, the Sun's gravitational force .... and its motion around the Sun becomes	13) decreases - slower
14) The convex mirror is a part of a sphere, its ..... surface is the reflecting surface and in the concave mirror ..... surface is the reflecting surface.	14) outer - inner
15) In the animal cell, the spindle fibers are formed by ...., while in plant cell the spindle fibers are formed from .... at the cell poles.	15) centrosome - cytoplasm condensation
16) ..... reproduction in plant's happens by plant's organs without the need of	16) vegetative - seeds
17) Acceleration is considered one of .... physical quantities, while time is considered one of ... physical quantities	17) vector - Scalar
18) ... and .... are used during wars to follow battle.	18) Lenses - binoculars
19) Long sightedness caused as a result of ..... of the radius of the ball thus the retina is .... to the eye lens.	19) the decrease - near
20) The big bang theory explain the origin of.....	20) universe

(2) complete

while the Nebular theory explain the origin of	solar system
21) Somatic cells are divided by ...., while reproductive cells are divided(by)...	21) mitosis _ meiosis
22) the founder of the modern theory is the scientist	22) Fred Hoyle
23) If the fertilized ovum contains 8 pairs of chromosomes this means that the unfertilized ovum contains .... chromosomes.	23) 8
24) Chemically, the chromosome consists of .... and	nucleic acid 24) DNA _ Protein
25) If the speed of a car is 72 Km/hour this means that its speed equal.... m/S	25) $72 \times \frac{5}{18} = 20$
26) The solar system is located in one of the ... arms of the ... galaxy.	26) spiral _ Milky way
27) Breadmold fungus reproduces asexually by ..., while hydra organism reproduces asexually by	27) sporogony _ budding
28) Sexual reproduction depends on two main processes, which are .... and	28) gametes formation fertilization.
29) The first phase for a cell To enter mitosis is	29) prophase
30) The two gases which produced galaxies, stars and are the universe over millions of years are helium and hydrogen with a percentage of ..., ... respectively.	30) 25%-75%

2) Complete

31) Velocity and displacement of an object are similar in .... and are differ in	31) direction - measuring unit
32) Some somatic cells in the human body are not divided at all such as .... and others are divided under certain circumstances such as	32) red blood cells - liver cells
33) The movement path may be ...., ... or combination of both.	33) straight - curved.
34) Astronomers use special equipments carried into space as .... in order to study the sun.	34) Hubble telescope
35) DNA (nucleic acid) carries .... of the living organism.	35) genetic information
36) Real image is not formed by ... lenses, ... mirrors and plane mirrors.	36) concave lenses convex mirrors.
37) In laplace's opinion, the nebula lost its sphere form and became in a form of a flat rotating disk under the effect of ...	37) centrifugal force
38) The optical piece which forms laterally inverted image and equal to the body is called	38) Plane mirror
39) In yeast, the bud emerges as a lateral bulge in the parental cell, then the cell nucleus is divided by .... division.	39) mitosis

2) Complete

40) In plants, male gametes are called ... while female gametes are called ...	40) Pollen grains ova.
41) the building unit of universe is ...., and its number in universe is about ...	41) the galaxy - 100.000 million galaxies
42) The centre of mirror curvature in convex mirror lies .... the reflecting surface.	42) behind
43) During the ... of mitotic division a series of adverse changes occur.	43) teLophase
44) At the end of 1st prophase of 1st meiotic division, the phenomenon of .... occurs.	44) crossing over
45) If (an) object starts its movement from rest, It means that its initial speed equal	45) Zero
46) A car moves in a certain direction by a speed equals 80 Km/h, its speed appears 40 Km/h for an observer moves with a speed .... in .... direction of the car.	46) 40 Km/h - the same

ReLative speed of the car = car speed − observer's speed

40 = 80 − 40

47) according to the modern theory, the cloud of gas was subjected to ... process forming moving planets.	47) cooLing

2) Complete

48) .... theory assumed that the origin of the solar system was from the explosion of the expanded part of the sun due to a huge star approached to it .	48) Crossing Star
49) Earliest Life forms began to appear on Earth after about ..... years from the big bang.	49) 12000 million
50) when an object moves at an acceleration equals Zero, this means that the speed of the object is	50) regular
51) The diameter of the thin Lens is .... that of the thick lens.	51) Larger than
52) The mass of cells produced due to the abnormal continuous division of cells is called	52) tumor
53) A long sighted person needs a medical eye glasses with a .... Lens	53) Convex
54) The spindle fibers are formed from .... in animal cell.	54) centrosome
55) The secondary axis of the mirror is any straight line that passes .... and any point on its reflecting surface except	55) the center of curvature - the pole.
56) Within minutes of the Big Bang, the atomic particles merged together producing .... and ...., which over the years produced galaxies, stars and the universe.	56) hydrogen - helium.

③ What would happen in the following cases:

1) Combination of the male gamete and female gamete
- The zygote will be formed.

2) The incident light ray falls passing the focus of the convex lens.
- It will refract parallel to the principal axis.

3) When combination of male gamete with female gamete to form zygote
- fertilization process occurs.

4) To the acceleration of an object moves at uniform speed.
- Body moves with zero acceleration.

5) putting a yeast fungus in a warm sugary solution
It reproduces by budding forming a new bud, that remain connected to the parent cell forming a colony or separated from the parent cell and becomes as a new fungus.

6) A light ray is incident passing through the center of curvature of a concave mirror.
- It will reflected on itself.

7) focusing laser on the gold Nano-molecules in the cells infected by cancer.
- The light energy transformed into heat energy. that burns and kill the cancer cells only.

③ What happens in the following cases:

8) Absence of centrosome from the animal cells.
- No spindle fibers will be formed.

9) The nebula lost its temperature in Laplace's opinion
- The size of nebula decreases, and its revolving around its axis increases.

10) starfish losses one of its arms, while it contains a part of the central disc.
- The animal will compensate its missing arm through regeneration, and the missing arm will form a new individual through reproduction by regeneration.

11) A person who has long sightedness defect is using a convex lens while reading.
- The defect will be corrected, where he can see near objects clearly.

12) A moving body covers the same distance in half the time according to its speed.
- Its speed increases to the double.

13) Reproductive cells don't divide by meiosis
- No gametes will be formed.

③ What happens when...?

14) A moving object completes a complete cycle (concerning its displacement).

- The amount of displacement = zero.

15) Incidence of a light ray parallel to the principal axis of a concave mirror (concerning its pathway).

- It reflects passing through the focus.

16) Plane mirror is put on the left side of the car driver.

- It will form an equal image, so the driver cannot see the whole road behind the car.

17) Incidence of a light ray by angle 60° on a plane mirror.

- It will reflected by angle = 60° from the plane mirror.

18) When a moving body returns back to its starting point (concerning its displacement)

Its displacement = zero.

19) The moving body takes double the time to cover half the distance according to its speed.

- Its speed decreases to quarter.

$v = \frac{d}{t}$ if $d_1 = 8m$, $t_1 = 2sec$

so $v_1 = \frac{8}{2} = \text{④} m/s$

when $t_2 = 2 \times t_1 \therefore t_2 = 2 \times 2 = 4s$

and $d_2 = \frac{1}{2} d_1 = \frac{1}{2} \times 8 = 4m$

So $v_2 = \frac{d_2}{t_2} = \frac{4}{4} = \text{①} m/s$

③ What happens when..?

20) Crossing over phenomenon doesn't occur.
-The variation of genetic traits don't occur among the individuals of the same species.

21) A light ray passes through the optical center of the lens.
-passes without refraction.

22) The diameter of the eye becomes Longer than a certain length
short sightedness.

23) The nucleus of the cell is removed.
The cell can not divided.

24) A light ray is incident by an angle 90° on a plane mirror
It reflects on itself.

25) The gravity between Sun and the planets rotate around is vanished.
-The planets will move freely in the space.

26) The final speed of a moving body is greater than its initial speed.
-The body moves with positive acceleration.

4

when will the following things happen ...?

- The distance covered by a body equals the amount of its displacement. one
- when the body moves in a certain direction and in a straight line.

- Reflection of light ray falls on spherical mirror on itself.
- When it falls passing through the centre of curvature.

- The relative speed of a moving object relative to an observer is more than its real speed.
- When the observer moves in opposite direction of the object.

④ **When do the following happen:**

① Passing of a light ray through a lens without refraction.
- When it passes through its optical center.

② Moving of an object with a negative uniform acceleration.
- When the speed decreases by equal values in equal periods of time.

⑤ **What are the results which happens due to the following?**

1) A nuclear explosion for a star near the sun. (according to Fred Hoyle theory.)
Huge amounts of gaseous materials resulted due to this explosion, which cooled forming the planets.

2) Putting an object in front of convex lens at its focus
No image is formed.

3) The incident light ray passes through the centre of curvature of the concave mirror
- It reflects back on itself.

4) Crossing over phenomenon occurs.
Genetic variation

5) The movement of galaxies with regular motion.
Expansion of the universe.

6) A huge star approached the Sun according to the crossing Star theory.
This star attracted the Sun to it, leading to a great expansion in the part of the Sun facing it.

7) Elongation in the ball diameter of the eye ball.
short sightedness.

(6) Compare between each of the following:

(1)	positive acceleration	Negative acceleration
Definition	It is an acceleration by which an object moves in a straight line when its speed increases by equal values through equal periods of time	It is an acceleration by which an object moves in a straight line when its speed decreases by equal values through equal Periods of time.
Final speed	The final speed of an object > the initial speed.	the final speed of an object < the initial speed
	Its value is Positive	its value is negative

(2)	Somatic cell	Reproductive cell
a. type of division	mitosis	meiosis
b) Number of resulting cells	2	4

(3)	speed	Velocity
Definition	distance covered through a unit time	displacement covered through a unit time.

(4)	Amoeba	Yeast fungus
type of asexual reproduction	Binary fission	Budding

(5)	Short-sightedness	Long-sightedness
The position of the images concerning the retina	The image formed in front of the retina	The image formed behind the retina.
-The radius of the eyeball	increased	decreased.
The convexity of the eye lens surface	increased	decreased
The correction (type of lens that is used in treatment	By using a Concave lens	by using a Convex lens

(6)	Acceleration	Mass
Type of physical quantity	vector	Scalar

(7)	Bread mold fungus	sponge
The way of reproduction	sporogony	Budding

(8)	Big Bang theory	nebular theory
Their importance	Explain the origin of the universe	Explain the origin of the Solar system

(9)	Mitotic division	meiotic division
The cells in which they occur	Somatic cells	reproductive cells

(10)	Average speed	irregular speed
Definition	It is the total distances covered divided by the total periods of time	it is the speed by which the object moves to cover unequal distances at equal periods of time

(11)	Pollen grains	sperms
site of formation	Anther of flowering plants	Testes of human and animals

12 Focus of the concave mirror	focus of the convex mirror
- It is a real focus	It is a virtual focus
- It is the point of collection of the reflected light rays.	- It is the point of collection of the extensions of the reflected light rays.
- It is located in front of the concave mirror	It is located in the back of the convex mirror.

(13)	Sexual reproduction	Asexual reproduction
Definition	It is a Kind of reproduction that involves (2) living organisms, one of them is a male and the other is a female	It is a Kind of reproduction that involves only one parent
Genetic traits of (resulted offspring) new individuals	The new individual carries combined traits of both parents	the new individual exactly looks like its parent

(14)	Scalar physical quantities	Vector physical quantities
definition	It identified by Knowing its magnitude only, like mass	It identified by Knowing its magnitude and direction, like velocity

(15)	Nebular theory	modern theory
The name of the Scientist founder	Laplace	Fred Hoyle

(16)	Concave mirror	Convex mirror
The method of obtaining a virtual image	object put at a distance less than the focal length	object put at any distance

(17)	Reproduction by binary fission	reproduction by budding
Example	Bacteria	yeast

(18)	Hydra	starfish
Type of reproduction	Budding	Regeneration

(19)	Male gamete	female gamete
Example	sperm	ovum

(20)	virtual image	real image
its property, inverted or upright	(upright)	(inverted)

(21)	Uniform speed	non_uniform speed
Definition	It is the speed by which the object moves when it covers equal distances at equal periods of time	it is the speed by which the object moves when it covers (unequal) distances at equal periods of time

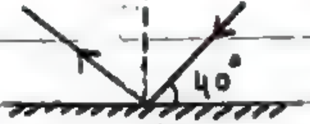
(22)	() Thick convex lens	() Thin convex lens
The focal length	It has a small focal length	It has a large focal length

(23)	Reproductive cell	Gamete
The division	Meiosis division	doesn't divide

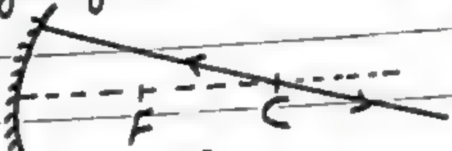
(24)	Animal cell	Plant cell
Formation of spindle fibers	The spindle fibers are formed by the centrosome	the spindle fibers are formed from condensing the cytoplasm at two poles of the cell

(7) . . . . figures

① calculate the value of reflecting angle in both the two figures



(1)



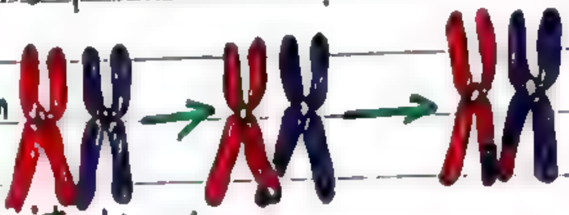
(2)

(1) 50° (2) Zero°

② Study the following figure which explains the steps of one of the biological phenomenon, then answer the following questions.

1] What's the name of this phenomenon?

2] Mention the phase in which that phenomenon occurs.



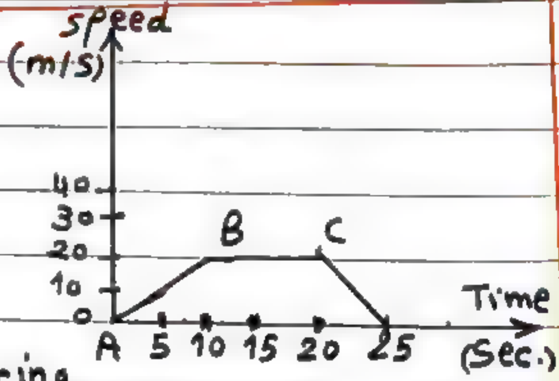
3] What is the type of its division?

4] What are the results which are produced if that phenomenon did not happen?

1] crossing over phenomenon. 2] At the End(of) prophase 1

3] Meiosis 4] There is no genetic variation in the individuals of the same Kind.

③ The opposite graph represents the movement of a car from rest point, study the graph and answer:

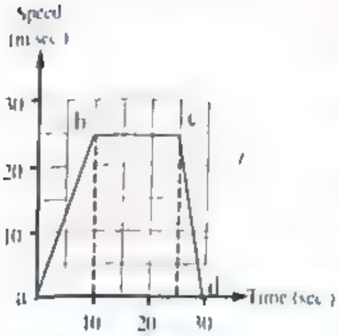


1) Moving with uniform acceleration is represented by the straight line ....

2) Calculate the acceleration of the car during its movement from the point (B) to (c).

Answer 1) AB and CD 2) $a = \frac{V_2 - V_1}{\Delta t} = \frac{20 - 20}{10} = \text{Zero}$

④ A car moves in straight line, and its speed recorded within 30 seconds, then it was represented graphically as shown in the opposite figure :
From the graph extracts the needed information to complete the following table :



Phases of the car movement	phase a b	phase b c	phase c d
The initial speed (V_1)	.... (1)	25 m/sec	.... (2) ....
The value of acceleration	2.5 m/sec^2	.... (3)	.... (4) ....
The description of movement	.... (5)	.... (6)	The car moves with negative acceleration

Answer

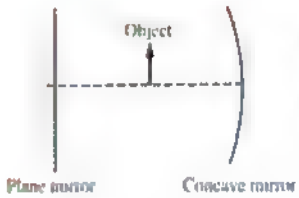
(1) Zero (2) 25 m/sec (3) Zero (4) $a = \frac{0-25}{30-25} = \frac{-25}{5} = -5 \text{ m/sec}^2$

(5) The car moves with positive acceleration.

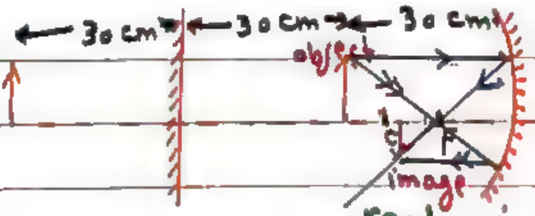
(6) The car moves with Zero acceleration.

⑤ In the opposite figure :

An object was put in the mid distance between a concave mirror (its focal length is 10 cm) and a plane mirror, so the image was formed by the plane mirror at a distance 30 cm from the plane mirror.



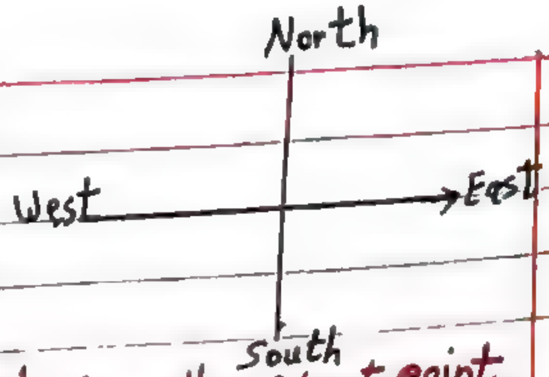
1. Draw the path of light rays for the formed image by the concave mirror.
2. Mention the properties of the formed image by using the concave mirror.



f = 10
r = 20
The object is far from the (C)

real - inverted - diminished

⑥ A person moved from start point (12) meters to the west then he returned in the same path 8 meters to the east calculate:



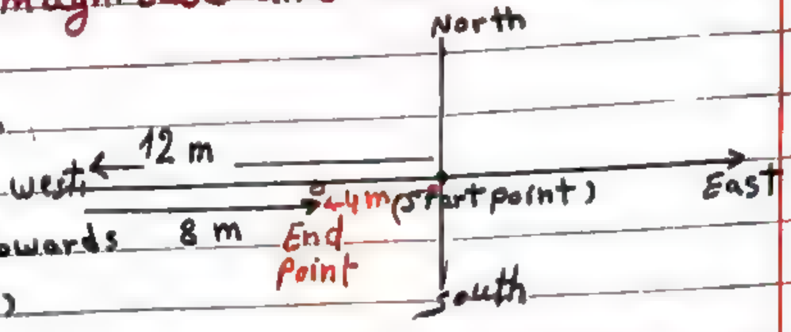
1. The distance covered by the object from the start point.
2. The displacement (magnitude and direction)

The Answer :

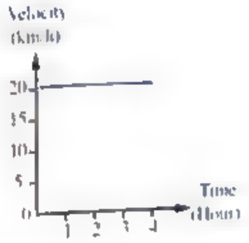
1. Distance = 12 + 8 = 20 m.

2. The displacement from the start point towards the end point (west)

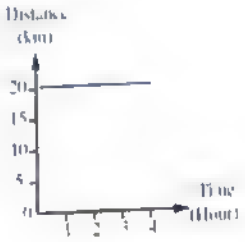
= 12 - 8 = 4 m (west).



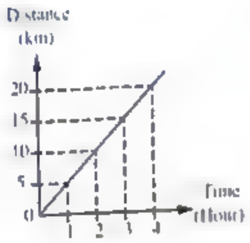
⑦ Three cars (A, B, C) their motion are represented by the following graphs. Study the graphs then answer :



(A)



(B)



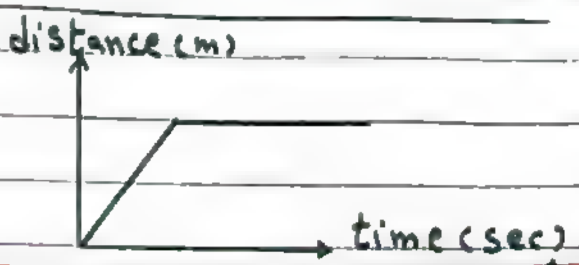
(C)

First: 1. The speed of car (A) equals ( ) Km/h.
2. The speed of car (B) equals ( ) Km/h.
3. The speed of car (C) equals ( ) Km/h.

Second: The relative speed of car (A) to an observer in car (c) when: 1. Both cars (A) and (c) move in the same direction equals ( ) Km/h. 2. Both cars (A) and (c) move in opposite direction equals ( ) Km/h.

First: 1. ⓘ20 2. Zero 3. 5 Second: 1. 15 2. 25

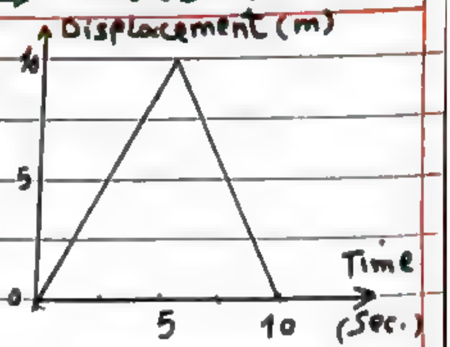
⑧ Show by drawing the relation (distance - time) graph for an object moves at a uniform speed and then it stops.



⑨ From the opposite figure calculate:

1. Total distance 2. Displacement

3. Velocity after the first five seconds.



The answer:

1. Total distance = 10 + 10 = 20 m

2. Displacement = Zero

3. $V = \frac{10}{5} = 2$ m/sec

⑩ ⓐ What is the name of each living organism and mention the type of asexual reproduction in each.

ⓑ What happen to both (1), (2) during the reproduction process.

Fig.(1)

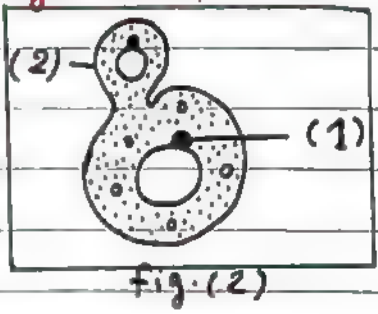


Fig.(2)

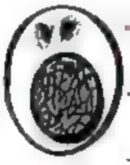
The answer: ⓐ ① Mushroom fungus reproduce asexually by sporogony ② Yeast fungus reproduce asexually by budding.

ⓑ (1) The nucleus divided by mitosis to 2 nuclei, one of them remain and the other one migrates to the bud.

(2) The bud grow into new fungus, that separates or remain on the mother cell forming a colony.

(11) From the opposite figure :

1. Write the name of this phase ?
2. When does this phase happen ?
3. Why does the cell passes through this phase ?



① InTerphase ② Before the cell division

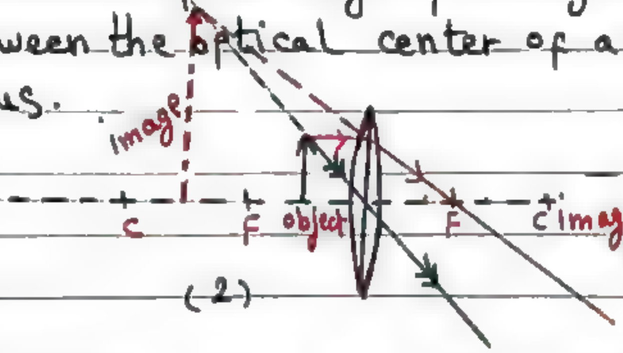
③ To prepare the cell for division Process,

by occurance of some important biological processes and Duplicating the amount of the genetic material (DNA)

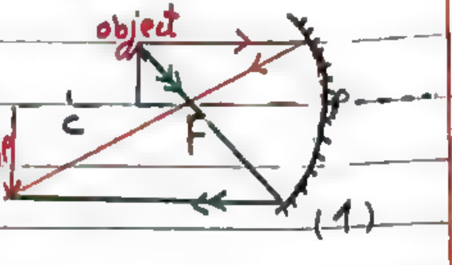
(12) show by Labeled drawing only:

1) Formation of the image of a body which is placed between the center of curvature of a concave mirror and its focus

2) formation of the image of a body which is placed between the optical center of a convex lens and its focus.



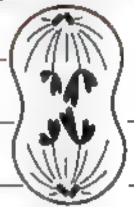
(2)



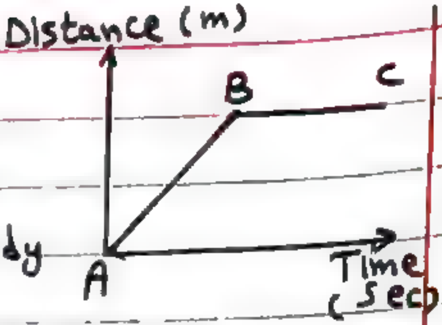
(1)

(13) The opposite figure represents a phase of division of a reproductive cell

1. Mention the name of this phase.
2. What is the type of cellular division it belongs to ?
3. MenTion the importance of this type of division.



1) Anaphase 1 2) Meiosis 3) Gametes formation



⑭ 1. Determine the intervals during which the body moves at uniform speed.

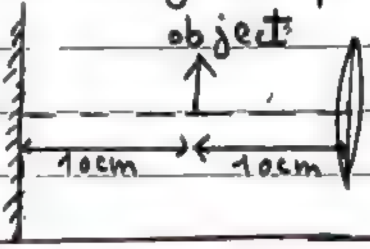
2. The time intervals during which the body at rest.

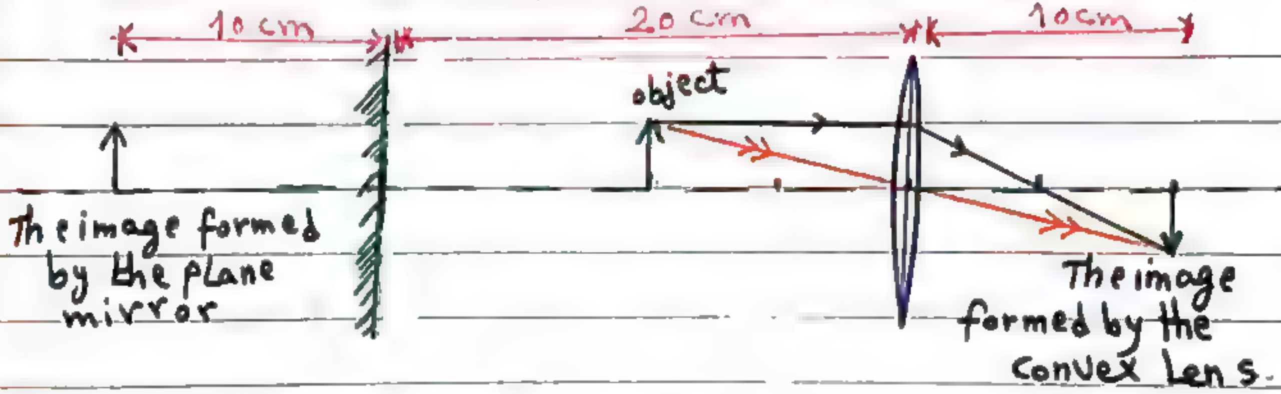
1) AB 2) BC

⑮ An object was placed in the middle between a convex lens whose focal length is 5 cm and a plane mirror, the distance between them was 20 cm (as in the figure.)

1. Find the distance between the image formed by the convex lens and the image formed by the plane mirror.

2. Mention the properties of the image formed by the convex lens.


object
10 cm
10 cm

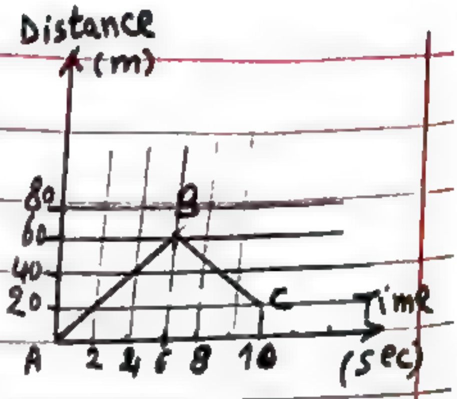

10 cm
20 cm
10 cm
object
The image formed by the plane mirror
The image formed by the convex lens.

1) Distance = 10 + 20 + 10 = 40 cm

2) Image properties : real, inverted and equal to the object.

(16) The opposite graph represents the movement of a body from point (A) to point (C) passing by point (B) calculate the following:

1. Speed 2. Velocity



1. Distance $= 60 + (60 - 20) = 100\,m$

$V = \frac{d}{t} = \frac{100}{10} = 10\,m/sec$

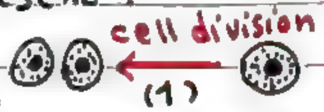
2. Displacement $= 20\ m\ \overrightarrow{AC}$

velocity $= \frac{\text{displacement}}{\text{time}} = \frac{20}{10} = 2\ m/sec\ \overrightarrow{AC}$

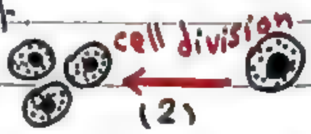
(17) Study the opposite figures, then answer:

Mention the number of the figure that represent:

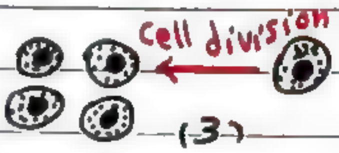
1. A scientific mistake.
2. Reduces the number of chromosomes to half.
3. Produces the compensation of the damaged cells and repairing cells of wound.
4. the variation of genetic traits among the individuals of the same species.



(1)



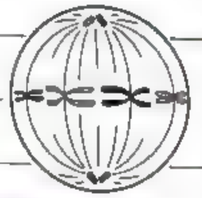
(2)



(3)

1. (2) 2. (3) 3. (1) 4. (3)

18) look at the opposite figure, then answer:



1. To which type of cell division it belongs?
2. What is the name of this phase?
3. What happens in this phase? or what are the changes occur in this phase?
4. What are the importance of this type of division?

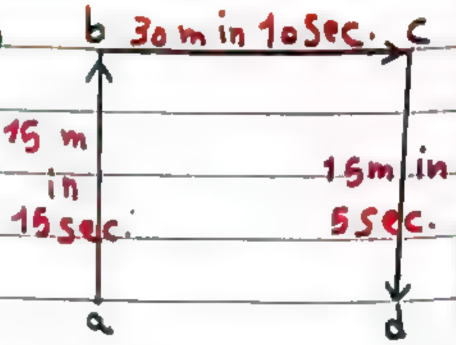
The answer:

1. Mitosis 2. Metaphase

19 3. The chromosomes which are connected with the spindle fibers are arranged at the cell equator.

4- Growth of the living organisms and compensation of the damaged cells.

20 A body started its motion from (a) and covered 15 meters northward within 15 seconds, then 30 meters eastward within 10 seconds, and then 15 meters southward within 5 seconds as shown in the figure.



Find distance covered by a body, displacement and velocity.

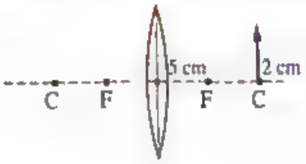
Distance = 15 + 30 + 15 = 60 m.

Displacement = 30 m eastward.

velocity $= \frac{\vec{d}}{t} = \frac{30}{30} = 1$ m/sec eastward.

21 **Study the following figure then answer the following :**

1. Complete the path of the rays to form an image.

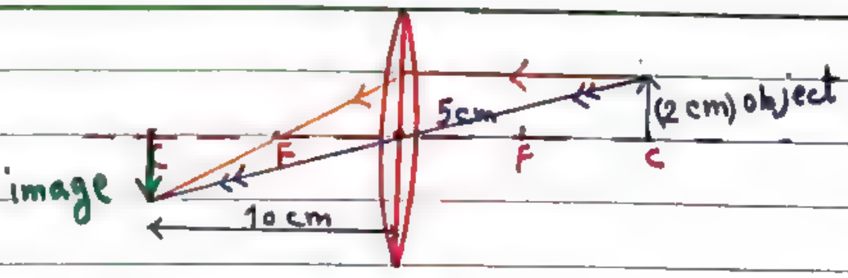


2. Complete the following :

a. The length of the image = ... cm.

b. The distance between the image and the optical center of the lens is .... cm.

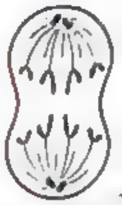
1)



2) a) 2 cm

b) 10 cm

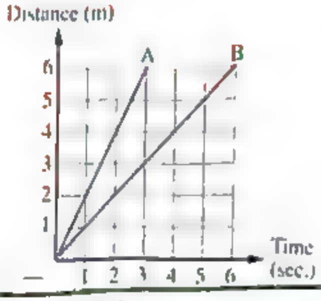
22 **Examine the opposite figure which represents one of the phases of cellular division, then answer the following :**



1. What happens when the spindle fibers shrink in this phase ?
2. What are the changes that occur in the previous phase ?

1- Two identical groups of chromatids are formed, each group migrates towards one of the cell's poles.
2. Chromosomes are arranged along the cell equator where each chromosome is attached with one of the spindle fibers at its centromere.

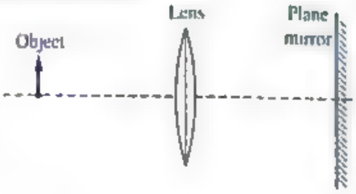
23 - The opposite graph represents the relation (distance – time) for two moving bodies (A) and (B)



1. What is the kind of speed in which the two bodies move.
2. Which of them moves with a greater speed ? and why ?
3. Calculate the speed of a body (A).

1. Both bodies are moving with a regular speed
2. The body (A) is faster than the body (B) because it covers the same distance (6m) in a shorter period of time (3sec).
3. $v = \frac{d}{t} = \frac{6}{3} = 2$ m/sec.

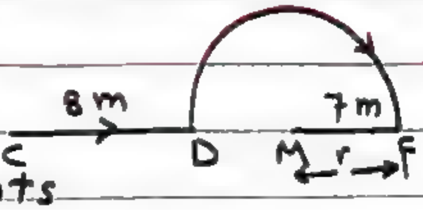
24 In the opposite figure:



-An object is placed in front of a convex lens and put on the other side a plane mirror, when we look in the mirror, we find that no image is formed for the object, :
1. Mention the position of the object from the lens.
2. Why no image is formed for the object inside the mirror.

1. At the focus. 2. Because the refracted light rays from the lens are parallel and don't intersect.

(25) In the opposite figure:
An object is moving from point (C) to point (M) passing by two points (D, F) in (5 sec.) calculate:
1. The covered distance 2. The velocity



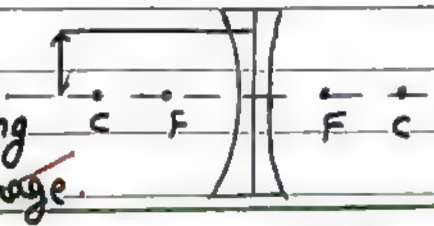
1. Distance $= 8 + (\frac{1}{2} \text{ circumference}) + 7 =$

$= 8 + (\frac{1}{2} \times 2 \times \frac{22}{7} \times 7) + 7 = 37 \text{ m}$

2. Displacement $= 8 + 7 = 15$ m (east direction).

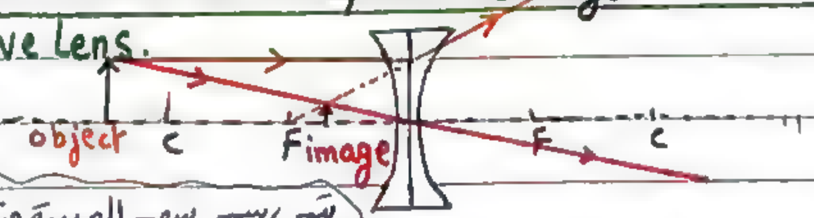
Velocity $= \frac{\text{displacement}}{\text{time}} = \frac{15}{5} = 3$ m / sec (east direction)

(26) From the opposite figure:
1. What is the type of lens
2. Complete the light rays after drawing in your answer sheet to form the image.



1. Concave lens.

2.



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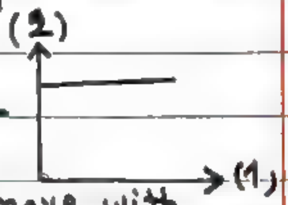
(27) In the following graph, mention the name of horizontal axis (1) and vertical axis (2)



Axis (1) is time axis.

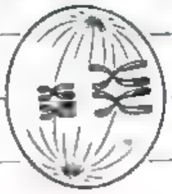
Axis (2) is speed axis.

object move with acceleration = Zero

From the opposite figure :

1. What is the name of this phase ? and which type of cell division it belongs ?
2. Describe what happens in this phase ?

1. Metaphase 1, meiosis
2. chromosomes pairs arrange at the cell equator



8) Various questions

1) A Train starts to move from rest in straight Line, its speed reaches 36 m/Sec after 9 sec. calculate the acceleration of the train and find its type

$v_1 = 0 \quad v_2 = 36\ m/sec \quad t = 9\ sec$

$\therefore a = \frac{v_2 - v_1}{t} = \frac{36-0}{9} = 4\ m/sec^2$ (Positive acceleration)

2) A racer cover a distance (50 meter) by running within a time (5 second), then return to the start point walking within (20 second) calculate average speed of the racer:

1. while running 2. While returning back.

1. $\bar{v} = \frac{50}{5} = 10\ m/sec$. 2. $\bar{v} = \frac{50}{20} = 2.5\ m/sec$.

3) A runner covered a distance of 240 meters in 16 Seconds then he returned back walking to the start point in 2 minutes. calculate the average speed of his complete trip.

$\bar{v} = \frac{240 + 240}{16 + 120} = \frac{480}{136} = 3.5\ m/sec$.

4) Two cars start their movement on an inclined road at the same moment, the first car rises up the inclined road with regular speed equal 30 m/sec. and the second car moves down the inclined road with initial speed equal 10 m/sec, and uniform acceleration of 5 m/sec^2. If the two cars meet each other after 5 seconds passes from that moment find the relative speed of the first car that is observed by the driver of the second car when meeting of the two cars.

$\therefore a = \frac{v_2 - v_1}{t} \quad \therefore v_2 = v_1 + at = 10 + (5 \times 5) = 35\ m/Sec$.

$\therefore$ The two cars are opposite in direction

$\therefore$ Relative speed $= 30 + 35 = 65\ m/sec$.

Firstcar
$v_1 = 10\ m/s$
$V =$
$V_2 = v_1 + at$
30 m/s

speed of observer

5) A car moves by regular speed equals 90 Km/h on free road(of) Banha, then the driver used the brakes the car stops after 10 seconds, calculate the acceleration and what is its type?

$v_1 = 90\ Km/h = 90 \times \frac{5}{18} = 25\ m/Sec$

$a = \frac{v_2 - v_1}{t} = \frac{0 - 25}{10} = -2.5\ m/sec^2$ (decelerating motion)

6) A moving car by a uniform speed covers 80 meters in 4 seconds, then the driver press the brakes, so it stopped after 4 seconds.
Find: The magnitude of the acceleration
1. within 1^{st} 80 meters. 2. After pressing the brakes.

80 meters

$V_2 = Zero$ $\quad v = v_1$

$v = \frac{80}{4} = 20\ m/s$ (regular speed)

$a = Zero$

1. $a = Zero$

2. $v_1 = \frac{80}{4} = 20\ m/Sec$

$a = \frac{v_2 - v_1}{t} = \frac{0 - 20}{4} = -5\ m/Sec^2$

7) Two cars move in the same direction if the speed of the first car is 30 km/h and the second car is 50 km/h.

Calculate the relative speed of the second car relative to an observer :

1. Standing on the ground. 2. Sitting in the first car.

3. What are you conclude from the resultants ?

1- The relative speed of the second car relative to an observer standing on the ground = the real speed of the second car = 50 Km/h

2. The relative speed = the real speed - the observer's speed
= 50 - 30 = 20 Km/h

3 - The relative speed depends on the observer condition and his direction.

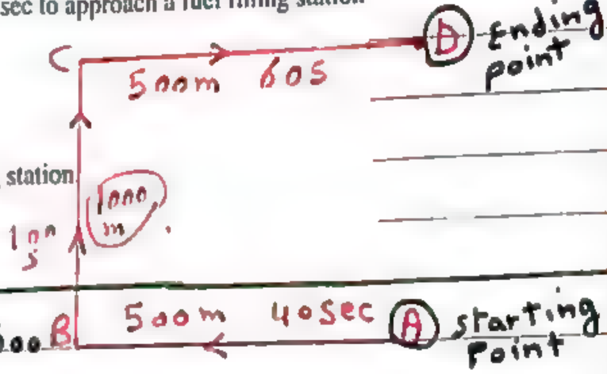
8) A train starts to move at 7 o'clock in the morning then, What is the time of arriving if it moves with speed 100 Km/h to cut a distance of 500 Km.

$t = \frac{d}{v} = \frac{500}{100} = 5\,h$ Time of arrival = 7 + 5 = 12 A.M.

9) A car covered 500 meters westward within 40 sec, then only one kilometer northward within 100 sec, then 500 meters eastward within 60 sec to approach a fuel filling station

Calculate the following :

1. The total distance covered by the car.
2. The total time taken to cover this tour.
3. The displacement from starting point to the filling station.
4. The velocity of the car.
5. The average speed of the car.



1. Total distance = 500 + 1000 + 500 = 2000 m.

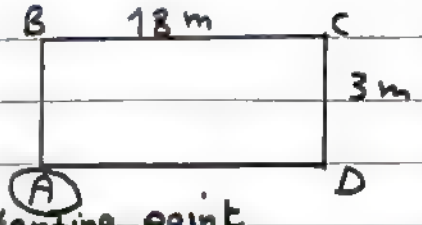
2. Total time = 40 + 100 + 60 = 200 sec

3. Displacement = 1000 m northward.

4. velocity $= \frac{1000}{200} = 5$ m/sec northward.

5. Average speed $= \frac{\text{total distance}}{\text{total time}} = \frac{2000}{200} = 10$ m/sec

10) A hand-ball field in the form of a rectangle of 18 meters length and 3 meters width, what is the a mount of distance and displacement covered by a player moves around the field one complete cycle. :



Distance = 18 + 3 + 18 + 3 = 42 m

Displacement = Zero because → starting point and Ending point

11) A train moves with a speed of 20 m/s and when using the breaks it moves with deceleration $4 m/s^2$. **Calculate** the time required to stop the train.

$v_1 = 20 m/sec \quad v_2 = 0 \quad a = \boxed{-} 4 m/sec^2 \quad t = ?$

$t = \frac{v_2 - v_1}{a} = \frac{0 - 20}{4} = 5 sec$

---

12) An object starts its motion from rest with regular acceleration (can) be calculated from the relation ($a = \frac{10}{t}$):

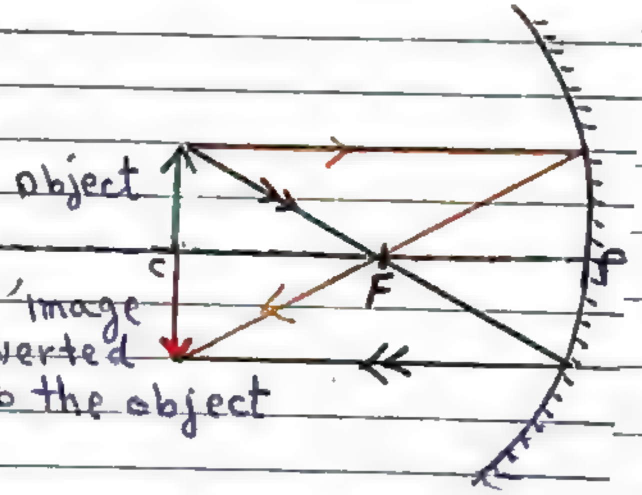
1. Find the final speed of the object.
2. Mention the type of regular acceleration.

1 - $a = \frac{v_2 - v_1}{t} \qquad \frac{10}{t} = \frac{v_2 - (zero)}{t} \quad \therefore v_2 = 10 m/s.$

2. Positive acceleration

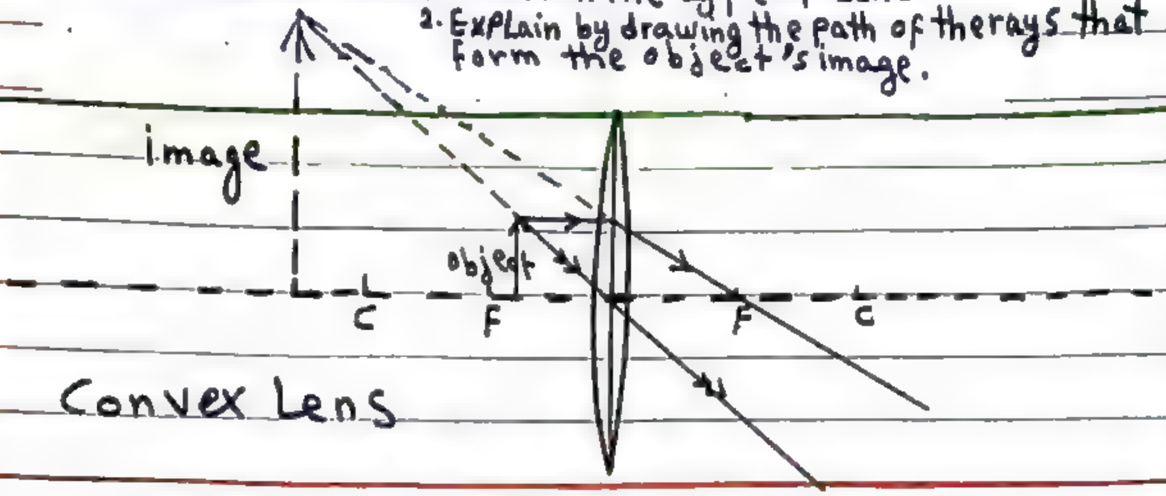
---

12) Illustrate by drawing the image formed by concave mirror when the object is at the centre of curvature of the mirror, then mention the properties of this image?



real, inverted and equal to the object

13) An object is placed at (3 cm) from the optical centre of a lens, then a magnified virtual image for the object is formed : 1. Mention the type of Lens
2. Explain by drawing the path of the rays that form the object's image.



Convex Lens

14) what is the name of the phase where the following changes occurs during cell division:
1. Chromosomes are arranged a long the equator of the cell
2. Doubling the genetic material.

1) Metaphase 2) Interphase.

15) What is the importance of the following:
1. The attraction force of the Sun.
2. The nucleic acid in the chromosome structure
3. the anther in the flowering plants.

1. Controls the planets revolving around it.
2. Carry the genetic information of the living organism.
3. forming the pollen grains in the flowering plants.

16) which of the following organs show the right number of chromosomes ?

The choice	a	b	c	d
The organ	Liver	testes	uterus	ovaries
Its cells has (2n)	✓	✗	✗	✓
Produce cells has (n)	✓	✓	✗	✓

ⓓ

⑰ Mention one difference between the virtual image of an object which is formed by each of concave lens, and convex lens.

- virtual image of the concave lens is diminished.
- virtual image of the convex lens is magnified.

⑱ Mention the name of the phase in which the following changes occur during the cell division:

1 - At its end the nucleolus and nuclear membrane disappear.
2 - Two identical and separated groups of chromatids are formed.
3. It occurs when a complete set of chromosomes that have the same number of the mother cells chromosomes, is formed.

1. prophase 2. anaphase 3. telophase

19) What is the role of :

1. The spindle fiber during cell division: during anaphase the spindle fibers begin to shrink and two identical groups of chromosomes are formed at the two poles of the cell.

2. The chromosome: It contains the nucleic acid (DNA) that carries the genetic traits of the living organism.

20) **Determine the type of the optical piece (lens or mirror) then mention its type (concave – convex – Plane) when it is able to :**

1. Form a virtual upright minimized image in the same side of the object, whatever its distance of it.
2. Form a virtual upright enlarged image on the other side of the object, only if the object placed at a distance less than its focal length.

1. concave lens 2. concave mirror

21) sexual reproduction depends on two main processes, what are they?

a) Gametes formation (b) fertilization

22) A person can be seen near objects clearly but far objects seems distorted.

1. what is the name of this vision defect and what are its reasons
2. How can you correct this defect, and give reason for your answer?

1- Short sightedness because of increasing in the eyeball diameter and increasing in the convexity of the eye lens surface.

2- by using a medical eye glasses with concave lenses because it diverges the rays coming from the far objects before falling on the eye. so the image is formed exactly on the retina.

23) **An object was placed at a distance 20 cm from optical center of a lens then a real, diminished image is formed and when the object moves 8 cm toward the lens then a real, equal image to the object is formed :**

1. What is the type of the lens and describe it ?
2. Calculate the focal lens of this lens.

is formed at a distance = (r) = 20-8= =12 cm from the optical center

So (r) = 12cm.

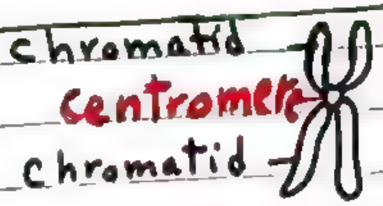
$f = \frac{1}{2} r = 6cm$

1- convex lens: it is a transparent optical piece which is thick at its center and less thickness at the tips, it collects light rays falling on it after refraction.

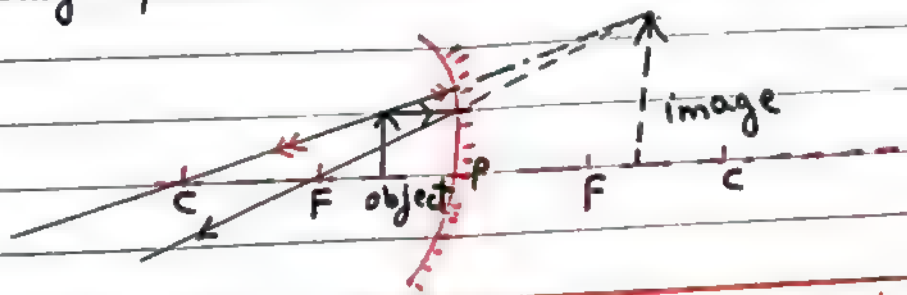
2- F = 6cm

24) 1. **Mention** the general structure of the chromosome, show your answer with drawing and label it.

The chromosome consists of two chromatids, connected at the centromere.



25) Show with drawing formation enlarged - erect image by using spherical mirror.



26) What is the importance of: (the function of:)

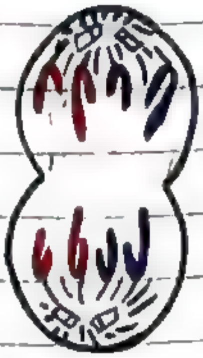
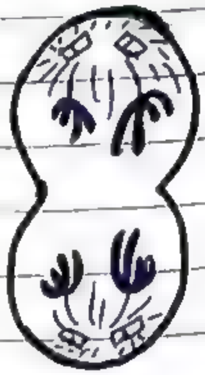
1. Interphase in cell division: In interphase the cell prepared for division by:
- occurrence of some important biological processes.
- Duplicating the amount of genetic material (DNA)

2. Convex mirror in your car: It forms an erect minimized image for the road behind the car.

3. Concave mirror in medical: It is used by dentists to form a magnified image of the teeth at the back of the mouth cavity (molars teeth)

4- The centrosome (central body) in the animal cell: It forms the spindle fibers, which play an important role during the cell division

27) Show with drawing, and explain what happen in the following phases:

1. Anaphase	2. Anaphase 1
	
- The centromere of each chromosome splits lengthwise into two halves, so the chromatids separate from each other. - spindle fibers begin shrink and two identical groups of chromosomes (each contains single chromatid) are formed.	- The spindle fibers (shrink), so every two homologous chromosomes move away from each other.

28) Mention the properties of the formed image in each of the following cases:

1. An object is put in front of a convex lens at a distance less than its focal length.
2. An object is put at the focus of a convex lens.

1- Virtual, erect and magnified image.

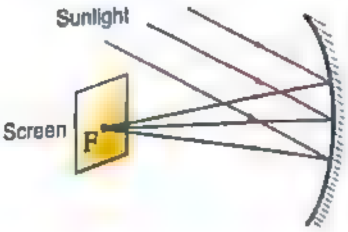
2. No image is formed.

29) Explain how to determine the focal length of a concave mirror (explaining your answer by drawing)

Activity 3 The focus and the focal length of the concave mirror.

Materials :

- A concave mirror.
- A screen.
- A far light source (as the Sun).



Steps :

1. Place a concave mirror facing the Sun rays (parallel light rays).
2. Move the screen in front of the concave mirror to obtain the smallest and clearest image.
3. Measure the distance between the lit point and the pole of the mirror.

Observation :

The parallel light rays coming from the Sun are reflected and collected in one lit point (smallest and clearest image).

Conclusions :

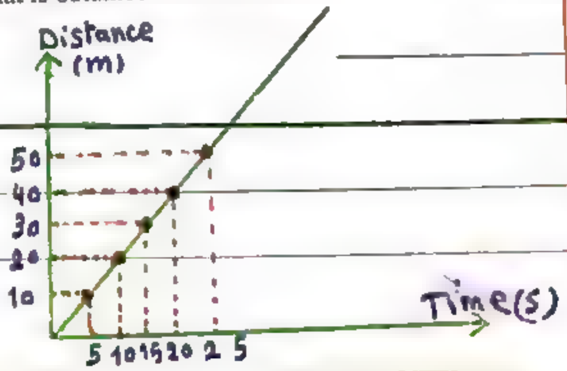
1. The point of the collection of the parallel light rays after being reflected from the concave mirror is called "The focus of the mirror".
2. The distance between the focus of the concave mirror and its pole is called "The focal length of the mirror".

NB Focal length (f) = $\frac{1}{2}$ × radius of mirror curvature (r) $f = \frac{1}{2} r$

30) A body moves in a straight line, and the distances covered in different times is recorded in the opposite table :

The Distance (m)	10	20	30	40	50
The time (s)	5	10	15	20	25

1. Draw the relation between (distance – time) graphically that is obtained from the values shown in the table.
2. Calculate the speed of moving a body.



$V = \frac{10}{5} = \frac{20}{10} = 2 \text{ m/sec}$

31) If the number of chromosomes in a starfish mother cell is (2N), how many chromosomes are there in the cells resulted by regeneration? Why?

- Equals (2N), because reproduction by regeneration is a type of mitosis.

32) Two cells are divided, one in a female liver and another in her ovary:

Mention: 1. The kind of cell division in each cell.

2. The number of cells produced from each division.

3. The number of chromosomes in each resultant cell.

Female liver cell	Female ovarian cell
1 - Mitosis	1 - Meiosis
2 - 2 cells	2 - 4 cells
3 - 2 N	3 - N

33) Mention the conditions of occurrence for each of the following :

1. The reproduction by regeneration in starfish when it loses one of its arms.

2. The collection of the rays after being reflected from the concave mirror in the focus of the mirror.

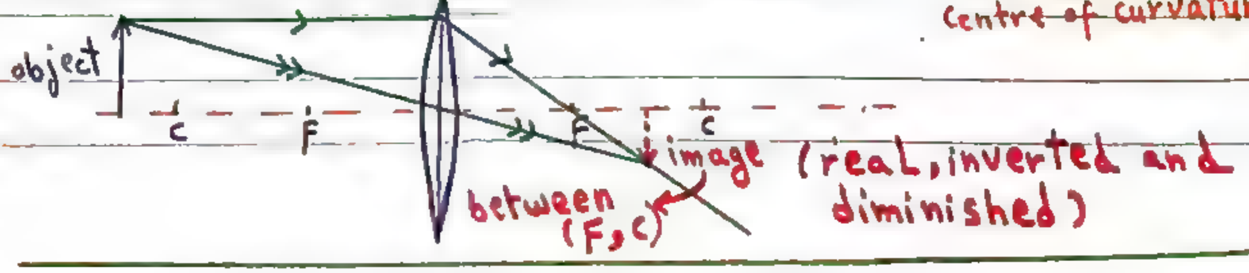
1. If the arm contains a part of the central disc.

2. If they fall parallel to each others, and parallel to the principal axis.

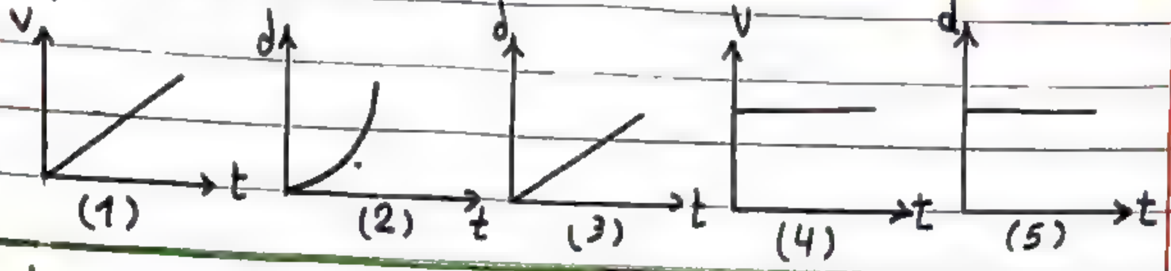
34) An object is placed at a distance of 5 cm. from convex lens its focal length is 2 cm. → r = 4 cm

The object is far from the centre of curvature

Draw a diagram to show the path of rays that form the image of the object, showing the position and the properties of the image on the drawing only.



35) from the following graphs: Determine two graphs represent the case of an object moves with acceleration does not equal zero.



Graphs (1), (2),

36) If the number of chromosomes in a human pancreatic cell is 23 pairs, what is the number of chromosomes in the following cells :

1. sperm. 2. fertilized ovum

1. 23 chromosomes 2. 23 pairs of chromosomes.

37) (Metaphase – Prophase – Telophase – Anaphase) :

1. Arrange these phases according to the priority of occurrence.
2. Which type of division has these phases ?

1. Prophase - Metaphase - Anaphase - Telophase
2. Mitosis.

38) State the importance of Nanogold particles in the medical field.

- Treating of Cancer.

39) Mention the importance of Hydrogen and Helium (according to the Big Bang theory).

- They produce the galaxies, stars and universe through millions of years.

40 Two cells are divided in a plant, one of them in the stem and the other in the ovary, if you know the number of chromosomes in each of them is 8 pairs of chromosomes, mention :

1. The kind of cell division in each cell.
2. The type of reproduction in this plant.
3. The number of chromosomes in each resulted cell.

1. Mitosis in stem cell and meiosis in ovary cell.
2. Sexual reproduction.
3. (In stem cell : 8 pairs)(In ovary cell : 4 pairs (8))

41) Mention the type of asexual reproduction for each of the following

1. Sponges 2. Starfish

1. Budding 2. Reproduction by regeneration.

42) When the following values equals zero:

1. The acceleration of a moving body
2. The angle of reflection of a light ray from the reflecting surface of a plane mirror.

1. If the Object moves with a regular speed.
2. If the incident light ray falls perpendicular to the plane mirror

43) Mention the Measuring units of :

Measuring units

Scalar physical quantity	Its measuring unit
Speed	m/sec *Or* km/h.
Time	Second *Or* Hour
Mass	kg.
Length	Metre

Vector physical quantity	Its measuring unit
Acceleration	m/sec^2
Velocity	m/sec *Or* km/h.
Displacement	Metre
Force	Newton

44

Write the function of:

The item	Importance or uses
1. Concave mirror :	It is used : - In a torch to reflect light. - In front lights of cars to reflect light. - In shaving to get an enlarged and erect image of the face. - In marine lighthouses that are found at marine ports and at airports to guide ships. - In aircrafts landing at airports to guide aeroplanes. - In some types of telescopes to monitor the space and also to form an enlarged and near images of the celestial bodies. - In solar ovens to heat food, water .... etc. - By dentists to form a magnified image of the teeth at the back of the mouth cavity (molars teeth).
2. Convex mirror :	- In cars (on the right and the left sides of the driver) to form an erect and diminished image for the way behind the car. - At shopping center to allow high rate of security at these places. - On the corners of narrow roads to monitor cars movement on these narrow crossroads to avoid accidents. - At cars park to monitor cars movement at the park to avoid accidents. - At the platforms of the Metro and railway stations to avoid passenger injury at opening or closing the doors.
3. Lenses :	• They are used in many things as follows : - In medical eye glasses either for reading or walking. - The person who fixes the watches uses a magnifier lens to see the minute parts of the watches. - In the war, the leaders use binoculars to follow the battles. - In making telescopes and microscopes.
4. Telescopes :	They are used for formation enlarged images for the heavenly bodies.
5. Microscopes :	They are used for formation magnified images for the tiny bodies which cannot be seen with the naked eye.
6. Concave lens :	It is used to correct the short-sightedness.
7. Convex lens :	It is used to correct the long-sightedness.
8. Contact lenses :	They are used instead of the glasses to treat the vision defects.

Item	Importance or use
1. Solar telescope :	It forms a complete picture for the Sun.
2. Hubble telescope :	It collects photos for the universe that give us details about its state since millions of years, these photos give astronomers an opportunity to study the evolution of the universe after the Big Bang.

The speedometer in cars and planes: It measures the speed directly.

(45) If the number of chromosome in a gamete of an animal are 22 chromosome, what is the number of chromosomes in the cell of :

1. The zygote. 2. The testis. 3. The ovum.

1- 44 chromosomes 2- 44 chromosomes 3. 22 chromosomes.

(46) **What is the difference between each of the following :**

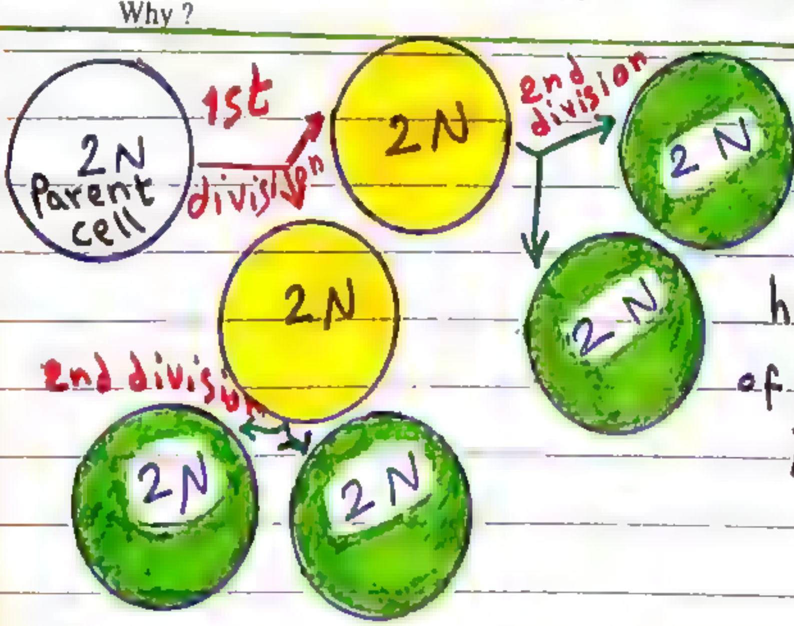
Asexual reproduction and sexual reproduction according to the hereditary trait of the resulting individual.

- Asexual reproduction gives individuals identical to the parent individual, because it depends on mitosis.
- Sexual reproduction gives individuals Combine genetic traits of both (male) and female individuals, because it depends on meiosis.

(47) **If you know that a cell in your body divided twice producing four cells. Answer the following :**

a. What is the type of division occurring in this cell ?

b. Does the number of chromosomes in the produced cells from this division change ? Why ?



a) Mitosis

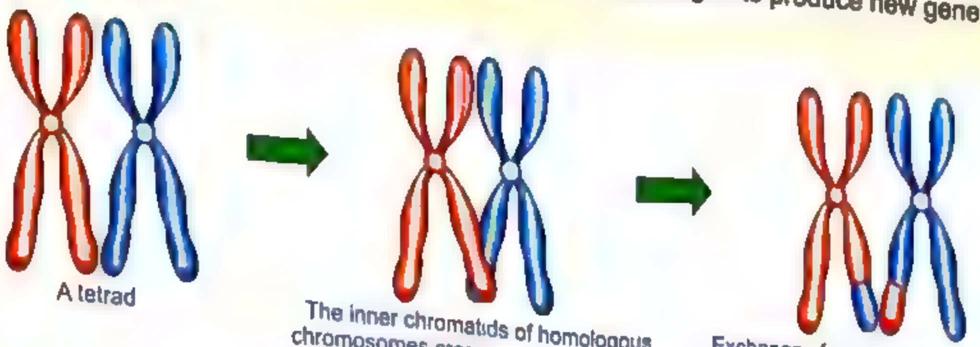
b) No, because each one of the produced cell has a complete number of chromosomes of the parent cell

(48)

Explain by drawing the crossing over phenomenon then mention its role in the variation of genetic traits among the individuals of the same species.

Crossing over phenomenon

It is a phenomenon that takes place at the end of prophase I in which some parts of the two inner chromatids of each tetrad are exchanged to produce new genetic arrangements.



A tetrad

The inner chromatids of homologous chromosomes crossing over each other

Exchange of some parts of the two inner chromatids in the tetrad

The crossing over phenomenon

Importance of the crossing over phenomenon :

- It works on the variation of genetic traits among the members of the same species, where it contributes in the exchange of genes (that carry genetic traits) between the two homologous chromosome's chromatids and distributing them randomly in the gametes.

(49) **According to the Big Bang theory, rearrange the following events from the oldest to the nearest :**

1. Sun was born and Earth and the planets were created.
2. Ancestral galaxies were evolved.
3. Earliest life forms began to appear on Earth.
4. Matter got joined in mass.

(4- 2-1-3)

Important theories

① Big Bang theory:

The Big Bang theory assumed that :

- The beginning of the universe was a gaseous ball of high pressure, high temperature and small in volume.
- A massive explosion occurs to this ball since 15000 million years and its components were scattered in space followed by continuous expansion and changing processes till now.
- Resulted from this explosion, all forms of matter, energy, space and time.

Theories about the evolution of the Solar System

② Nebular theory about the evolution of the solar system (Laplace 1796) :

- **Assumptions of nebular theory :**

It assumed that the origin of the solar system was the nebula.

1. **The contraction of nebula :**
   - The solar system originated from a glowing gaseous sphere revolving around itself, this sphere is called "Nebula".
   - By passing time, the nebula lost its heat gradually, so its size contracted and its revolving speed around itself (axis) increased.
2. **Formation of the gaseous rings :**

   The centrifugal force arising from the rotation of nebula around its axis led to :
   - The nebula lost its spherical form and became in a form of a flat rotating disk.
   - Separation of parts of nebula in the form of gaseous rings that also rotate around the remaining flaming mass from it and in the same direction.
3. **Formation of the solar system :**
   - The gaseous rings cooled down and frozen forming the planets of the solar system.
   - The flaming mass that is remained in the centre formed the "Sun".

③ The crossing star theory about the evolution of the solar system (Chamberlain and Moulton 1905) :

- **Assumptions of the crossing star theory :**

It assumed that the origin of the solar system was the Sun.

1. Another huge star (crossing star) approached to the Sun.
2. This star attracted the Sun to it which led to a great expansion in the part of the Sun facing this star.
3. **The expanded part from the Sun was exploded which led to :**
   - The Sun escaped from the gravity of that star.
   - A gaseous line was formed of a great length from the Sun to the last planets.
4. The gaseous line started to condense due to the attraction force, then it cooled forming the planets.

④ The modern theory about the evolution of the solar system (Fred Hoyle 1944) :

- **Assumptions of the modern theory :**

It assumed that the origin of the solar system was a star rather than the Sun.

1. A star was rotating near the Sun.
2. The star exploded due to huge nuclear reactions.
3. **The force of the explosion led to :**
   - The bombing of the star's nucleus away from the gravity of the Sun.
   - A gaseous cloud from this star remained around the Sun.
4. The gaseous cloud subjected to cooling and contraction processes forming the matter of planets, then the attraction force of the Sun controlled the orbits of planets around it.

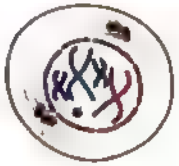
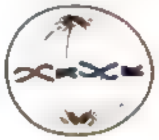
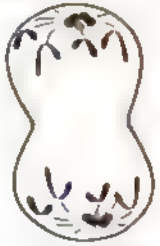
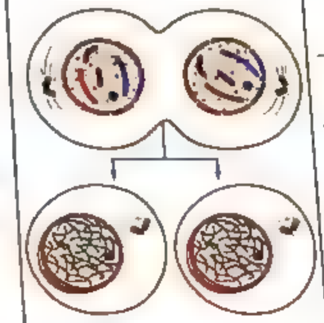
Importance :

1. Chromosomes :	• They represent the genetic material of the living organism. • They play an important role in the cell division. • Knowing the number of chromosomes helps in identifying the animal and plant species.
2. Centromere :	It is the point of connection of the two chromatids of chromosome.
3. DNA :	It carries the genes that carry the genetic traits of the living organism.
4. Mitosis :	It plays an important role in : - compensation of the damaged cells. - growth of living organisms (animals and plants). - completing the asexual reproduction process.
5. Interphase :	**It prepares the cell for division by :** • The occurrence of some important biological processes. • The duplicate of the genetic material (DNA).
6. Spindle fibers :	They pull the chromatids to one of the cell poles in anaphase to form two identical groups of chromosomes.
7. Meiosis :	Production of male gametes and female gametes to complete the sexual reproduction.
8. First meiotic division :	It produces two cells, each of them contains half number of chromosomes.
9. Second meiotic division :	It aims to increase the number of the produced cells from the first meiotic division.
10. Nano-molecules of gold :	Treating of cancer.
11. Proteins that are loaded on gold molecules :	Attach (adhere) to the cancerous cell to monitor it.
12. Laser in treating cancer by nanotechnology :	Burning and killing the infected cell.

- **Nebular theory, Crossing Star theory and Modern theory :**

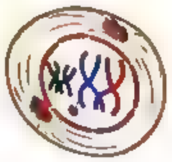
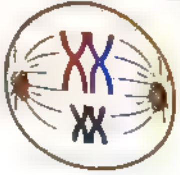
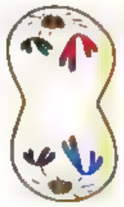
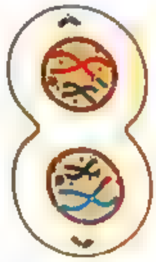
Points of comparison	**Nebular theory**	**Crossing star theory**	**Modern theory**
• The founder :	Laplace	Chamberlain and Moulton	Fred Hoyle
• The origin of the solar system :	A glowing gaseous sphere revolving around itself (Nebula)	The Sun.	A star rather than the Sun
• The force that causes the formation of the solar system :	The centrifugal force arising from the rotation of nebula around its axis.	The force of attraction of the crossing star and the force of explosion of the expanded part from the Sun.	The force of explosion of the huge star resulting from the occurrence of sudden and violent nuclear reactions within it

❶ Phases of mitosis :

The phase	The changes that occur in the phase	Figure
1. Prophase :	- Chromatin reticulum condenses, then appears in the form of chromosomes. - A network of spindle fibers is formed. - **At the end of this phase,** the nucleolus and nuclear membrane disappear.	 Prophase
2. Metaphase:	Chromosomes which are connected with the spindle fibers are arranged along the cell equator.	 Metaphase
3. Anaphase :	- The centromere of each chromosome splits lengthwise into two halves, so the chromatids separate from each other. - Spindle fibers begin shrink and two identical groups of chromosomes (each contains single chromatid) are formed.	 Anaphase
4. Telophase :	- The spindle fibers disappear. - A nuclear membrane and a new nucleolus are formed at each pole of the cell. - The chromosomes convert into a chromatin reticulum again. - **At the end of this phase,** the cell divides into two new cells, the number of chromosomes in each of them is equal to the number of chromosomes of the parent cell (2N).	

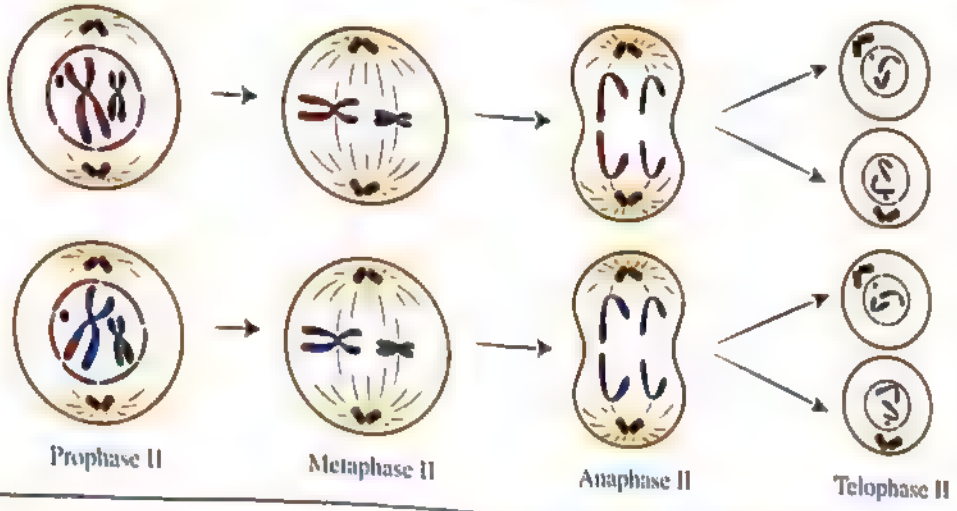
② Phases of meiotic division :

A) Phases of first meiotic division :

The phase	The changes that occur in the phase	Figure
1. Prophase I :	- Chromatin reticulum intensifies and appears in a form of distinct chromosomes. - Chromosomes are arranged in homologous pairs, each pair consists of 4 chromatids which are called a tetrad. **At the end of this phase :** - Crossing over phenomenon occurs. - Nuclear membrane and nucleolus disappear. - Each two homologous chromosomes (in the tetrad) move away from each other. - The spindle fibers appear and connect to the chromosomes at centromere.	 Prophase I
2. Metaphase I :	Chromosomes pairs arrange at the cell equator.	 Metaphase I
3. Anaphase I :	The spindle fibers shrink, so every two homologous chromosomes move away from each other.	 Anaphase I
4. Telophase I :	- The spindle fibers disappear. - A nuclear membrane and a new nucleolus are formed at each pole of the cell. - **At the end of this phase,** each cell divides into two cells, the nucleus of each of them contains half the original number of chromosomes of the parent cell chromosomes (i.e. each cell contains (N) chromosomes).	 Telophase I

B) Phases of second meiotic division :

- Each cell of the two cells resulted from the first meiotic cell division is divided in a way similar to the mitotic cell division.
- In the final phase (telophase II) of this division, four cells are produced and each of them contains half the number of chromosomes of the parent cell.



9 Give reasons

1- The long - sightedness person can't see the near objects clearly.

Because the image of near objects, is formed behind the retina.

2. The focal length of concave mirror can be determined by knowing its radius of curvature.

Because that, the focal length equals half the radius of curvature

$F = \frac{1}{2} r$.

3. The train moves with an irregular speed.

Because it covers unequal distances at equal periods of time.

4- Sexual reproduction is a source of the variation between individual.

Because the new individual gets the genetic traits from two sources (male and female gametes), and the crossing over Phenomenon occurs during gametes formation.

G.R.

5- The word Ambulance is written laterally inverted on Ambulance car.
Because the mirrors of the cars in front of the ambulance car, form a laterally inverted image for this word, and thus it appears laterally corrected to the drivers.

6. Binary fission is considered as a mitotic division.
Because the produced individual has the same number of chromosomes of the parental individual.

7- Pilots take in consideration the velocity of the wind during flying.
Because the wind direction detects the time of the trip and also the amount of the fuel consumed, due to it affects the speed of the plane.

8- The mitotic division is very important for the child's body and not the meiotic division.
Because mitotic division leads to growth which is important for child's body and also compensates the damaged cells.

9- The universe is in a continuous expansion.
Due to the continuous movement of galaxies away from each others.

10- The reproduction by spores is one of the forms of asexual reproduction.
Because it developed through one parental individual.

(G.R.)

11. Most of poeple can't write in a correct way, while they are seeing the paper through a plane mirror.
Because of the plane mirror forms a laterally inverted image.

12. The body that moves by uniform velocity has acceleration equal zero.
Because $\Delta V =$ Zero, whereas acceleration is the rate of change of velocity so it also equals zero.

13- Sexual reproduction is a source of genetic variation.
13. Sexual reproduction produces individuals different of their parents.
Because the newly formed individual takes the genetic material from male and female, and also due to the occurance of crossing over phenomenon during gametes formation.

14. The gamete contains half number of chromosomes existed in the somatic cell.
Because gametes are produced from meiosis, which is a reduction division.

15. A sexual reproduction Keeps genetic structure of the living organism.
Because it depends on one parental individual, and occurs through mitosis.

Q.R.

16. Con Cave mirror is used to generate high heat energy.
Because it collects the ray in one point, which is focus.

17- Real image cannot be formed by using a concave lens.
Because it is a diverging lens.

18. The object speed increases by decreasing the time taken to cover a certain distance.
Because there is an inversely relation between speed and time at constant distance.

19. The motion of a train can be considered from examples of motion in one direction.
Because it moves in a straight line (or) curved line or combination of both.

20. The human being noticed that when he looked at the still water surface, he could see as image of his face in the water.
Due to light reflection.

21. you could see the person who fixes the watches use a magnifier.
To see the very small parts of the watch.

22- The constancy of the planets in their orbits around the sun.
Due to the gravity of the sun.

ممسوحة ضوئيا بـ CamScanner

G.R.

23- The object that is placed at the focus of a convex lens has no image.
Because the refracted light rays are parallel.

24. The body which moves at an acceleration can't move at a regular speed.
Because its speed changed by time.

25. The number of chromosomes is constant in the same species which reproduce sexually.
Because each of male gamete and female gamete contains half number of chromosomes (N), by combination a Zygote is formed which containing the whole number of chromosomes (2N).

25. The force is (a) vector quantity.
Because it is identified by knowing both its amount and its direction.

26- The incident light (ray) which falls perpendicular on a plane mirror reflects on itself.
Because the angle of incidence equals the angle of reflection equals zero.

27. Physicists use mathematical methods like graphs and tables. In order to :- predict the relation between certain physical quantities - understand practical results - describe physical phenomena in an easier way.

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G.R.

28) Shrinking of spindle fibers during the anaphase of mitosis division.
To form two identical groups of chromosomes, each group migrates towards one of the cell's poles.

29) Meiosis is considered as a source of genetic variation in Living organisms.
Due to the occurrence of the crossing over phenomenon during it.

30) A convex (mirror) is put at the left and right side of driver
Because it forms virtual, erect and diminished image to the road behind the Car.

31) Most of moving cars cannot move practically all time with uniform speed.
Because the speed changes according to the road condition

32) Using a convex lens for correcting long-sightedness.
Because it collects the rays, so the image of the near objects are formed on the retina.

33) The offspring have genetic traits identical to the parent in case of asexual reproduction.
Because asexual reproduction depends on mitosis, where the new individual gets a full copy of the parental individual's genetic traits.

G.R.

34) In the plane mirror the image cannot be received on a screen.
Because it is (a) Virtual image

35) The amount of fuel consumed during flying between two cities differs by the difference of the wind direction.
Because the wind direction affect the velocity of the plane, and so the amount of fuel consumed.

36) The (Lens) has 2 centers of curvature but spherical mirror has one

36) The lens has two focus while the spherical mirror has one focus.
Center of curvature only

Because lens has 2 spherical surfaces, and mirror has one spherical surface.

37) Concave lens is used to correct the short-sightedness
Because it diverges the rays coming from far objects before falling on the eye, so the image is formed exactly on the retina.

38) (Distance-time) graph of an object that moves at a uniform speed is a straight line passing through the origin point.
Because distance is directly proportional with time when the object moves with a constant speed.

Give reason = Give Scientific correct reason

39) The moving car with a certain speed seems to be at rest, to a moving observer with the same speed and in the same direction
Because the relative speed equals the difference between the two speeds equals zero.

40) The explosion of some stars suddenly.
Due to nuclear reaction.

41) The interphase occur before the cellular division.
To prepare the cell for division, by occurrence of some biological processes, and duplicating the amount of the genetic material (DNA).

42) Meiotic division is called reduction division
Because it occurs to reproductive cells (2N) and produces gametes (N).

43) Vegetative reproduction of grape plant not produce new genetic properties.
Because it depends on mitosis division.

44) The convex lens is known as a converging lens, while the concave lens is known as a diverging lens.
Because the convex lens is a collecting lens, while the concave lens separates the light rays fall (on) it

Write the scientific term:

1- The value of change of an object's speed in one second.

2- A flat and gaseous round disk that formed the solar system.

3- A mirror that forms a virtual, upright and small image for an object.

4- It contributes in genes exchanging between the two homologous chromosome's chromatids and distributing them in the gametes.

5- It is located in one of the spiral arms of the Milky Way.

6- Asexual reproduction occurs by using plant organs except seeds.

7- The line joining between the two centers of curvature of lens passing by the optical center.

8- It is the phenomenon of the light bouncing off in same medium when it meets the reflecting surface.

9- The angle between the reflected light ray and the normal.
10- The expansion of the universe and the atomic particles merged together producing helium and hydrogen.

11- The moving object covers equal distances at equal periods of time.

12- The point of connection of two chromatids together.

13- The change of displacement relative to time.

14- A point located inside the lens on the principal axis in the mid distance between its faces.

15- It contains genetic material from each parent when it grows; it gives a new offspring whose traits combine each parent's traits.

16- It is the change in the object's speed in one second.

17- It is any straight line that passes by the center of curvature of the mirror and any point on its surface except the pole of the mirror.

18- A phase in which chromosomes pairs arrange on cell's equator.

19- The force that keeps the continuity of planets rotation in their orbits.

20- The value of an object's speed determined in relation to an observer.

21- The force of attraction between the masses of two objects is directly proportion with the amount of their masses and inversely with the square of distance between them.

22- The total distance that a moving object covers divided by the total time taken to cover this distance.

23- The point of collection of the parallel rays after being reflected from the concave mirror and can be received on a screen.

24- A phase where some processes occur upon which the formation of a complete set of chromosomes that equal in numbers with the parental cell.

25- The space that contains all the galaxies, stars and planets.

26- The image that can't be received on a screen.

27- A phenomenon that occurs at the end of prophase 1 and contributes in genes exchange.

28- A disease resulting from the formation of the image behind the retina of the eye.

29- The biggest star that can be seen clearly by people on the earth surface.

30- The unit that is used to measure the distances between the celestial bodies.

31- Angle of incidence = Angle of reflection.

32- The shortest straight line between two positions of a moving object.

33- The revolving of the earth around its axis in a period of time.

34- The ability of some animals to compensate their missing parts.

35- Cells that lead to the formation of gametes that contain N chromosomes.

36- The point of collection of parallel rays in the concave mirror.

37- A phase in which some important biologogical process occur to prepare the cell for division and genetic material in the cell is doubled.

Mr. Mohamed Taha

38- The point that is in the middle of the reflective surface of the mirror.

39- The combination of the male and the female gametes to form zygote.

40- It is the sun and eight planets revolving around it.

41- Twice the focal length of a spherical mirror.

42- The change of an object's location as time passes according to the location of another object.

43- A type of reproduction which considered a source of genetic variation.

44- A disease causes darkness of the eye lens.

45- An equipment was launched to the space; it allows astronomers an opportunity to study the evolution of the universe after the big bang.

46- A process in which the living organism produces individuals with hereditary traits different from the parents.

47- A cell division that occurs in the somatic cells and results in the growth of the living organism.

Give reasons:

1- Sexual reproduction is the source of variation between individuals.

2- The shortsighted person requires medical glasses with concave lenses.

3- Asexual reproduction produces offspring identical to the parents.

4-The perpendicular incident light ray on the plane mirror reflects on itself.

5- The continuous expansion of space.

6- The constancy of the Earth’s rotation in an orbit around the sun.

7- The difference in the day due to the difference of the planet.

8- The difference in the year due to the difference of the planet.

9- Force and acceleration are vectors physical quantities.

10- The long sight is treated by suitable convex lens.

11- Starfish continuous alive even a part of its body is cut.

12- The moving car seems stable to the observer moves with the same speed and direction.

13- The convex lens has two centers of curvatures, while the convex mirror has only one centre.

14- The uniform velocity of a car cannot be obtained practically.

15- It is impossible to obtain real image by using concave lens.

16- The focal vertex of the thick convex lens is less than the thin convex lens.

17- Interphase stage occurs before starting cell division.

18- The important of the crossing over phenomenon the first meiotic division.

19- Zygote contains the normal number of chromosomes of the organism.

20- The object that is placed at the focus of convex lens does not form an image.

21- Concave mirrors are used in solar ovens.

22- A convex mirror is put at the left side of the driver of the car.

23- The shortest year is on mercury planet.

Mr. Mohamed Taha

Complete the following:

1- Speed measuring unit is.................. and the acceleration measuring unit is..

2- The somatic cells divide by .... while the reproductive cells divide by ....

3- The crossing over phenomena takes place during ....of the .... division.

4- The stars move in fixed orbits around the centre of the ....

5- The scientist who founds chaos theory that explains solar system formation is ………………………..

6-The genetic material in the nucleus of the cell consists of a number of ………………

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8- The chromosomes pairs are arranged in first metaphase in the ……… line of the cell

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14- The displacement is considered as ………… quantity, while the mass is considered as ………………… quantity.

15- The radius of the concave mirror equals ………… of its focal length.

16- It is impossible to obtain real image by using the ………… lens or plane ……..

17- The spindle fibers are formed during the cell division in ……… And disappear in ………………

18- Amoeba reproduces by …………… bread mold fungus reproduces by ………

19- The result of multiplying (a speed of moving object × time) = …………..

20- The cell ………….. contains the genetic material which consists of number of …………………

21- …………….. is the image that can be received on a screen.

22- …………. Is structural unit of the universe and our galaxy is ………………..

23- From types of the asexual reproduction binary fission in ……………… budding as in ……………………

24- The chromosome consists of two connected threads at the Centromere point, each thread is called ………………….

25- ………. Are divided by meiosis which leads to the formation of ……......

26- …………….. rotates around the sun once every 12 earthly years.

27- Within minutes of the big bang, the atomic particles merged together producing ………… and …………… gases.

28- Meiosis division occurs in loving organisms that reproduce by …………..

29- The most important vision defects are ………….. and …………………..

Problems:

1- A convex lens with a focal length of 10 cm , an object was placed at a distance of 20 cm from the lens. Assign the distance of the object's image from the lens and mention its properties.

2- A race car can move from stationary position and its speed reaches 100 kilometers through 20 seconds. Calculate the acceleration of the car.

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3- A body started to move from point x to point A covering a distance of 30 meters to the north in 20 seconds, then it moves 60 meters eastward to point b within 30seconds then it moves 30meters southward to point c within 10 seconds.

Calculate: 1- the total distance covered by the body

2- the total time taken by the body 3- the average velocity 4- the average speed

4- A car moves in straight line, if its speed changes 5m/sec to 10m/sec within 5 seconds. Find the acceleration and its kind.

5- An object is placed in front of convex lens at distance of 6 cm. knowing that the focal length of this lens is 3 cm.

1- Determine by drawing the position of the formed image

2- Mention the characteristics of such image

6- If the number of chromosomes in a human pancreatic cell is 23 pairs of chromosomes. What is the number of chromosomes in the following cells:

- Skin - sperm - fertilized ovum

Choose the correct answer:

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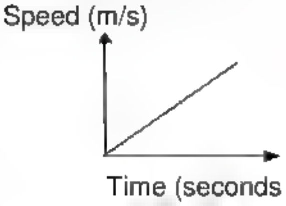

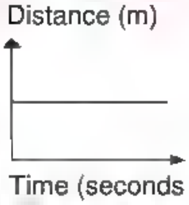

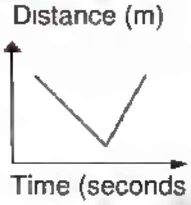

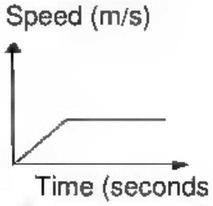

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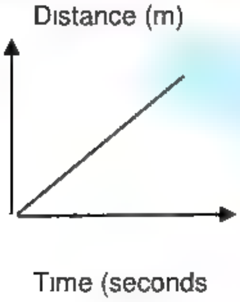
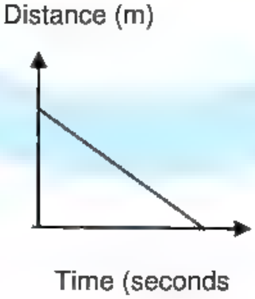
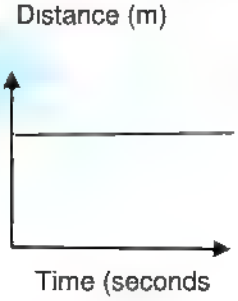
2- Which of the following graphs represent the movement of an object at constant speed?







3-The two factors can be used to describe the body motion are:

1- Speed and time 2- distance and time

3- Area and time 4- displacement and speed

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That means the produced speed is …………………. Speed
1-average 2-increasing 3- nail 4-decreasing

5- A concave lens is placed in the passage of sun rays; a very small image for the sun is formed at a distance 5 cm from the optical centre of the lens, if this lens is used to form an equal image for a body, what is the distance between the body and the optical centre of the lens?
1- 5 cm 2- 10 cm 3- 50 cm 4- 60 cm

6- In which of the following cases the lift rider feels weightlessness phenomenon
1-when the lift ascends upwards with uniform acceleration
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3-when the lift descends with uniform velocity
4- When the lift falls

Various questions:

1- Draw a diagram to illustrate the image formed when the object at a distance more than double focal length of concave mirror.

2- Compare between long and short sight from the following points:
a- The type of lens used in treatment of each one
b-The cause of each one

3- Mention an activity to determine the radius of curvature of a concave mirror?

Wishing you all good luck
Mr. Mohamed

Mr. Mohamed Taha

Model Answers

Write the scientific term:

1- The value of change of an object's speed in one second. **Acceleration**

2- A flat and gaseous round disk that formed the solar system**. Solar nebula**

3- A mirror that forms a virtual, upright and small image for an object. **Convex mirror**

4- It contributes in genes exchanging between the two homologous chromosome's chromatids and distributing them in the gametes. **Crossing over phenomenon**

5- It is located in one of the spiral arms of the Milky Way. **Solar system**

6- Asexual reproduction occurs by using plant organs except seeds. **Vegetative reproduction**

7- The line joining between the two centers of curvature of lens passing by the optical center. **Principal axis of the lens**

8- It is the phenomenon of the light bouncing off in same medium when it meets the reflecting surface**. Light reflection**

9- The angle between the reflected light ray and the normal. **Angle of reflection**

10- The expansion of the universe and the atomic particles merged together producing helium and hydrogen**. Big bang**

11- The moving object covers equal distances at equal periods of time. **Regular speed**

12- The point of connection of two chromatids together. **Centromere**

13- The change of displacement relative to time. **Velocity**

14- A point located inside the lens on the principal axis in the mid distance between its faces. **Optical center of the lens**

15- It contains genetic material from each parent when it grows; it gives a new offspring whose traits combine each parent's traits. **Zygote**

16- It is the change in the object's speed in one second**. Acceleration**

17- It is any straight line that passes by the center of curvature of the mirror and any point on its surface except the pole of the mirror. **Secondary axis of the mirror**

18- A phase in which chromosomes pairs arrange on cell's equator. **Metaphase**

19- The force that keeps the continuity of planets rotation in their orbits. Central **gravitational force**

20- The value of an object's speed determined in relation to an observer. **Relative speed**

21- The force of attraction between the masses of two objects is directly proportion with the amount of their masses and inversely with the square of distance between them. **Newton's law of universal gravitation**

22- The total distance that a moving object covers divided by the total time taken to cover this distance. **Average speed**

23- The point of collection of the parallel rays after being reflected from the concave mirror and can be received on a screen**. Focus of the mirror**

24- A phase where some processes occur upon which the formation of a complete set of chromosomes that equal in numbers with the parental cell. **Telophase**

25- The space that contains all the galaxies, stars and planets. **Universe**

26- The image that can't be received on a screen. **Virtual image**

27- A phenomenon that occurs at the end of prophase 1 and contributes in genes exchange. **Crossing over phenomenon**

28- A disease resulting from the formation of the image behind the retina of the eye. **Long sightedness**

29- The biggest star that can be seen clearly by people on the earth surface**. Sun**

30- The unit that is used to measure the distances between the celestial bodies. **Light year**

31- Angle of incidence = Angle of reflection. **First law of light reflection**

32- The shortest straight line between two positions of a moving object. **Displacement**

33- The revolving of the earth around its axis in a period of time. **Earth's day**

34- The ability of some animals to compensate their missing parts. **Regeneration**

35- Cells that lead to the formation of gametes that contain N chromosomes. **Reproductive cells**

36- The point of collection of parallel rays in the concave mirror. **The focus**

37- A phase in which some important biologogical process occur to prepare the cell for division and genetic material in the cell is doubled. **Interphase**

38- The point that is in the middle of the reflective surface of the mirror. **Pole of the mirror**

39- The combination of the male and the female gametes to form zygote. **Fertilization**

40- It is the sun and eight planets revolving around it. **Solar system**

41- Twice the focal length of a spherical mirror. **Radius of curvature**

42- The change of an object's location as time passes according to the location of another object. **Motion**

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43- A type of reproduction which considered a source of genetic variation. **Sexual reproduction**

44- A disease causes darkness of the eye lens. **Cataract**

45- An equipment was launched to the space; it allows astronomers an opportunity to study the evolution of the universe after the big bang. **Hubble telescope**

46- A process in which the living organism produces individuals with hereditary traits different from the parents. **Sexual reproduction**

47- A cell division that occurs in the somatic cells and results in the growth of the living organism. **Mitosis cell division**

Give reasons:

1- Sexual reproduction is the source of variation between individuals.

Because the produced individuals combine the genetic traits from two different parents male and female. Besides the crossing over phenomenon that leads to genes exchange within the chromosomes of each parent.

2- The shortsighted person requires medical glasses with concave lenses.

Because the concave lens diverges the light rays before entering the eye lens so the image is formed on the retina.

3- Asexual reproduction produces offspring identical to the parents.

Because it depends on mitosis cell division that produces two identical cells similar to the parent cell.

4-The perpendicular incident light ray on the plane mirror reflects on itself.

Because angle of incidence equals the angle of reflection equals zero.

5- The continuous expansion of space.

Because galaxies move away from each other

6- The constancy of the Earth's rotation in an orbit around the sun.

Because the rotation of the earth around the sun is controlled by two equal forces which are: central gravitational force of the sun and centrifugal gravitational force of the

7- The difference in the day due to the difference of the planet.

Because planets differ from each other in:

- The length of the radius
- The speed of rotation around their axes.

8- The difference in the year due to the difference of the planet.

Because planets differ from each other in:

- The distant away from the sun.

- The speed of rotation around the sun.

9- Force and acceleration are vectors physical quantities.

Because they have magnitude and direction.

10- The long sight is treated by suitable convex lens.

Because the convex lens converges the light rays before entering the eye lens so the image is formed on the retina.

11- Starfish continuous alive even a part of its body is cut.

Because starfish reproduces mitotically by regeneration.

12- The moving car seems stable to the observer moves with the same speed and direction.

Because the relative speed between them equals zero.

13- The convex lens has two centers of curvatures, while the convex mirror has only one centre.

Because the convex lens has two spherical surfaces, while the convex mirror has only one spherical surface.

14- The uniform velocity of a car cannot be obtained practically.

Because the car speed depends on the traffics.

15- It is impossible to obtain real image by using concave lens.
Because the refracted rays by the concave lens are not intersected.

16- The focal vertex of the thick convex lens is less than the thin convex lens.

Because the radius of the thick convex lens is less than that of the thin one.

17- Interphase stage occurs before starting cell division.

To duplicate the genetic material and prepare the cell for division.

18- The important of the crossing over phenomenon the first meiotic division.

To make variation in the genetic traits among the members of the same species.

19- Zygote contains the normal number of chromosomes of the organism.

Because it is produced from the combination between the male and female gametes, since each one contains half number of chromosomes (N).

20- The object that is placed at the focus of convex lens does not form an image.

Because the refracting rays through the lens pass parallel and do not meet.

21- Concave mirrors are used in solar ovens.

Because they collect a large amount of solar rays in a focus.

22- A convex mirror is put at the left side of the driver of the car.

To form an erect, virtual and small image for the way behind the car.

23- The shortest year is on mercury planet.

Because it is the nearest planet to the sun.

Complete the following:

1- Speed measuring unit is **meter/second** and the acceleration measuring unit is **meter/second^2**

2- The somatic cells divide by **mitosis division** while the reproductive cells divide **by meiosis division**

3- The crossing over phenomena takes place during **first prophase** of the **meiosis** division.

4- The stars move in fixed orbits around the centre of the **galaxy**

5- The scientist who founds chaos theory that explains solar system formation is **La Place**

6-The genetic material in the nucleus of the cell consists of a number of **chromosomes**

7- From the examples of asexual reproduction, budding in **yeast** Fungus

8- The chromosomes pairs are arranged in first metaphase in the **equator** line of the cell

9- Meiosis cell division occurs in the anther of a flowering plant to produce **pollen grains**

10- The solar system is located in one of the spiral arms of **Milky Way** galaxy.

11- The longest day is of **Venus** planet, whereas the shortest one is of **Jupiter**

12- The incident light ray which is parallel to the principal axis of a concave mirror reflects passing through **the focus**

13- The chromosome chemically consists of nucleic acid called **DNA** and protein.

14- The displacement is considered as **vector** quantity, while the mass is considered as **scalar** quantity.

15- The radius of the concave mirror equals **twice** of its focal length.

16- It is impossible to obtain real image by using the **concave** lens or plane **mirror**

17- The spindle fibers are formed during the cell division in **prophase** and disappear in **telophase**

18- Amoeba reproduces by **binary fission** bread mold fungus reproduces by **spore propagation**

19- The result of multiplying (a speed of moving object × time) = **distance**

20- The cell **nucleus** contains the genetic material which consists of number of **chromosomes.**

21- **Real** is the image that can be received on a screen.

22- **Galaxy** Is structural unit of the universe and our galaxy is **Milky Way**

23- From types of the asexual reproduction binary fission in **amoeba** budding as in **yeast fungus**

24- The chromosome consists of two connected threads at the Centromere point, each thread is called **chromatid**

25- **Reproductive cells** Are divided by meiosis which leads to the formation of **gametes**

26- **Jupiter** rotates around the sun once every 12 earthly years.

27- Within minutes of the big bang, the atomic particles merged together producing **hydrogen** and **helium** gases.

28- Meiosis division occurs in loving organisms that reproduce by **sexual reproduction**

29- The most important vision defects are **short sightedness** and **long sightedness**

Problems:

1- A convex lens with a focal length of 10 cm , an object was placed at a distance of 20 cm from the lens. Assign the distance of the object's image from the lens and mention its properties.

The distance between the image and the lens = 20cm

The properties of the image: (Real, inverted and equal in size to the body)

2- A race car can move from stationary position and its speed reaches 100 kilometers through 20 seconds. Calculate the acceleration of the car.

A = v2 – v1/ t = 100000 – 0/ 20 = 5000m/sec2

3- A body started to move from point x to point A covering a distance of 30 meters to the north in 20 seconds, then it moves 60 meters eastward to point b within 30seconds then it moves 30meters southward to point c within 10 seconds.

Calculate: 1- the total distance covered by the body (30 + 60 + 30 = 120 meter)

2- The total time taken by the body (20 + 30 + 10 = 60 seconds)

3- the average velocity(60/60= 1 m/sec) 4- the average speed (120 /60= 2 m/sec)

4- A car moves in straight line, if its speed changes 5m/sec to 10m/sec within 5 seconds. Find the acceleration and its kind.

A= $V_2 – V_1$/ t = 10-5/5 = 1 m/sec^2 . Positive acceleration

5- An object is placed in front of convex lens at distance of 6 cm. knowing that the focal length of this lens is 3 cm.

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1- Determine by drawing the position of the formed image (on the center of curvature at a distance of 6 cm)

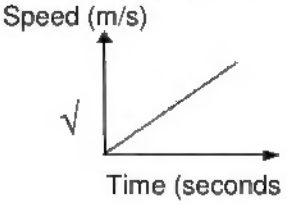
2- Mention the characteristics of such image
(Real, inverted and equal in size to the body)

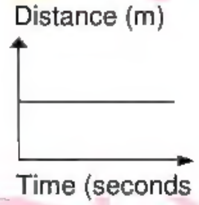
6- If the number of chromosomes in a human pancreatic cell is 23 pairs of chromosomes. What is the number of chromosomes in the following cells:

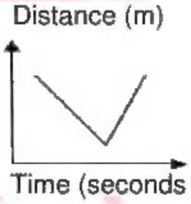
- Skin (46) - sperm (23) - fertilized ovum (46)

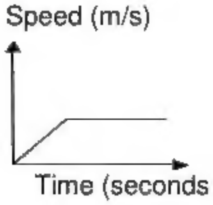
Choose the correct answer:

1- Which of the following graphical relations represents the moving of the body by uniform acceleration?









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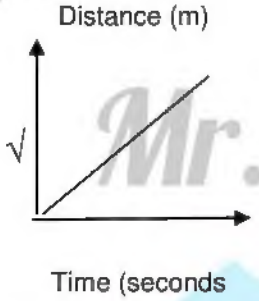

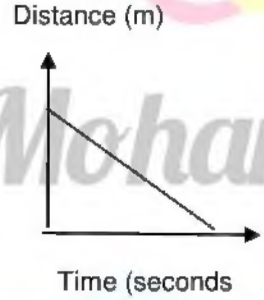

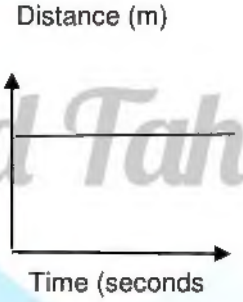

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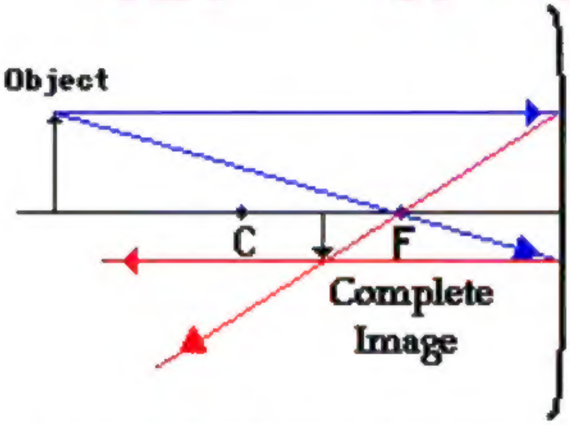
The Professor

Various questions:

1- Draw a diagram to illustrate the image formed when the object at a distance more than double focal length of concave mirror.



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2- Compare between long and short sight from the following points:
a- The type of lens used in treatment of each one
b-The cause of each one

Short sight	Long sight
What causes it? a. The diameter of the eyeball is too long. b. The curvature of convex lens is Strong.	What causes it? a. The diameter of the eyeball is too short. b. The curvature of convex lens is weak.
4. It is treated (corrected) by using Concave lens (diverging lens).	It is treated (corrected) by using convex lens (converging lens).

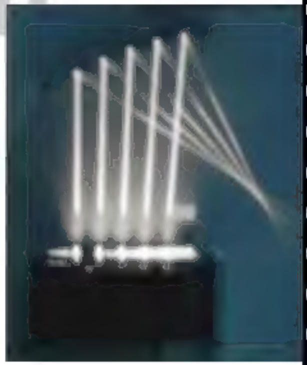
3- Mention an activity to determine the radius of curvature of a concave mirror?

Steps:

1. **Place a concave mirror on a holder in front of a light source (description: a box which contains a bulb & light shines through a tiny opening)**
2. **Move the mirror at different distances until you get an image equal in size to the original spot of light.**
3. **Measure the distance between the mirror & the opening of the box.**

Conclusion

The **focal length** is the distance between the focus & the pole.
the focal length = ½ the radius of the curvature



تمنياتى للجميع دوام التوفق

Mr. Mohamed Taha

The Professor
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